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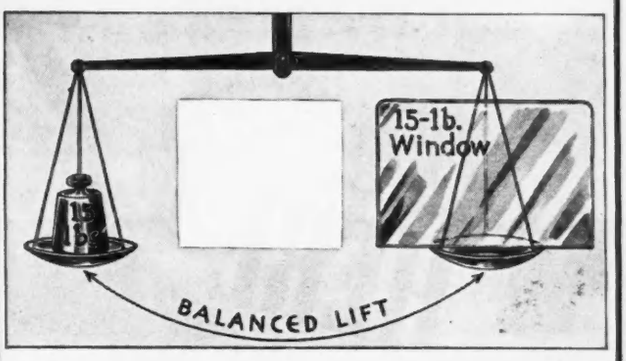

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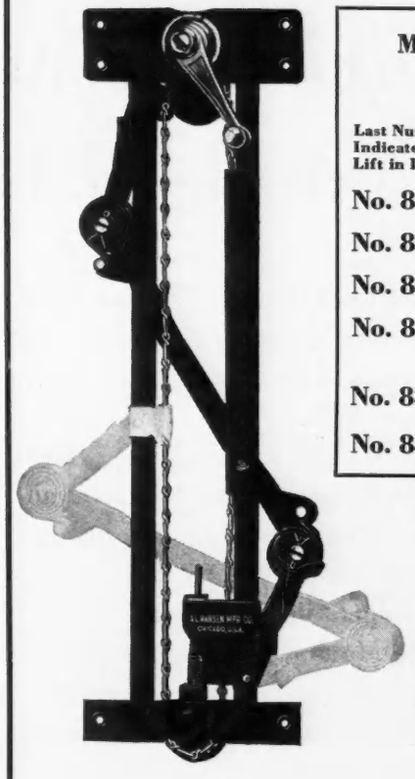

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Phantom and full view showing travel of balanced lift.

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TEXACO

COMMERCIAL CAR JOURNAL'S 1937 HIGHWAY TRANSPORTATION Show

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THE Freedom of the Highways

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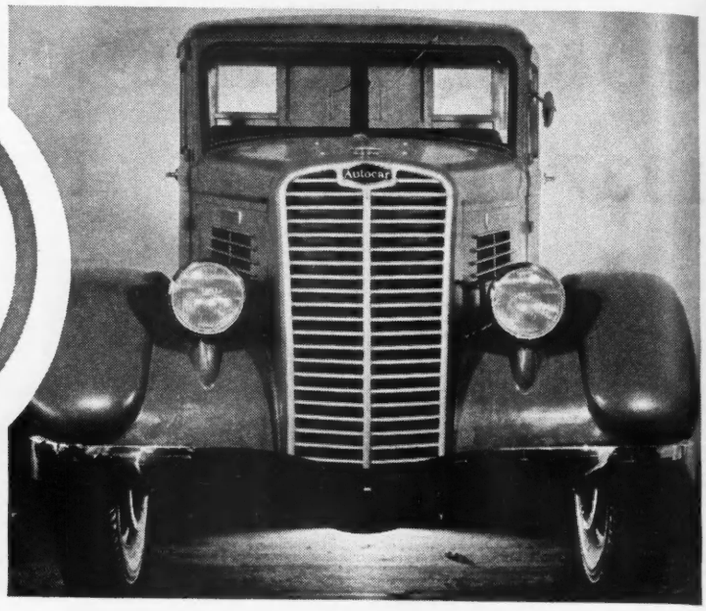
THIS SHOW NUMBER is the first of its kind. Its appearance coincides with the national and local shows, and its purpose is to bring a truck transportation show to the desks of the thousands in the fleet field and the truck industry who will not have the opportunity of attending any of the public exhibits. Those who get the opportunity should take advantage of it. The others need feel no sense of loss because no public exhibit will be as comprehensive in its coverage of the new things for fleet operation as this Highway Transportation Show that you hold in your hands.

A vital part of this Show Number is the special legislative section beginning on page 37. We feel it is our duty to the fleet field and to the industry not only to show what is new in the way of transportation equipment, but to point out the legislative developments that menace the economic use of such equipment, and to fight their growth.

We know you will find this issue profitable and we hope to improve it in the years to come so that it becomes a welcome institution.

COMMERCIAL CAR JOURNAL NOVEMBER 1936 VOL: LII No. 3

New Trucks



AUTOCAR

Smart Styling and Low Price Combined in Medium-Duty Line

THE AUTOCAR CO., Ardmore, Pa., enters 1937 with an announcement of importance. This is the introduction of the Model RL, a medium-duty chassis, which strikes a new note in Autocar appearance, and marks a milestone in the matter of list price.

The closest we can come to the list price now is that it will be in the neighborhood of $2,000. This carries the heavy-duty line down into the lower price class, the tag being well under any that Autocar has offered in years.

The Model RL is rated at 4-5 tons with a gross weight rating of 20,000 lb. The Autocar Blue Streak engine with a piston displacement of 358 cu. in. is the power unit. The frame is 8 15/16 in. heat-treated carbon steel.

The Model RM is slightly lighter, with a tonnage rating of 3½-4½ and a gross weight rating of 18,000 lb. The Blue Streak engine has a cubic-inch displacement of 313 and the frame is 8 1/16 in. heat-treated carbon steel.

Both models have Autocar five-speed transmissions, double - reduction rear axles and four-wheel vacuum-operated brakes.

The smart styling is apparent in the two pictures on these pages.

AVAILABLE

Drop Frame Delivery Chassis Is $845 with 4-Cylinder Engine

A NEW drop-frame, short-coupled delivery chassis has been added to its line by Available Truck Co., Chicago, Ill. With a four-cylinder engine it is known as P-105, and with a six-cylinder as P-106. The tonnage rating is ¾-1 and the gross vehicle weight 8500 lb. Chassis weights are 2425 for the four, and 2675 for the six. List prices are $845 and $940 respectively.

The four-cylinder engine is the Waukesha FC, 3¼ x 4, with a displacement of 133 cu. in. and a torque of 98 lb. ft.

The six-cylinder powerplant is the Continental F6209, the last three figures indicating the displacement with a bore of 3 3/16 and a stroke of 4⅜. The torque is 154 lb. ft.

The transmission is a four-speed Warner Gear T9; semi-floating rear axle, the Timken 51200; front axle, the Timken 30000 H; brakes, Lockheed four-wheel internal hydraulic, with a lining of 250 sq. in.

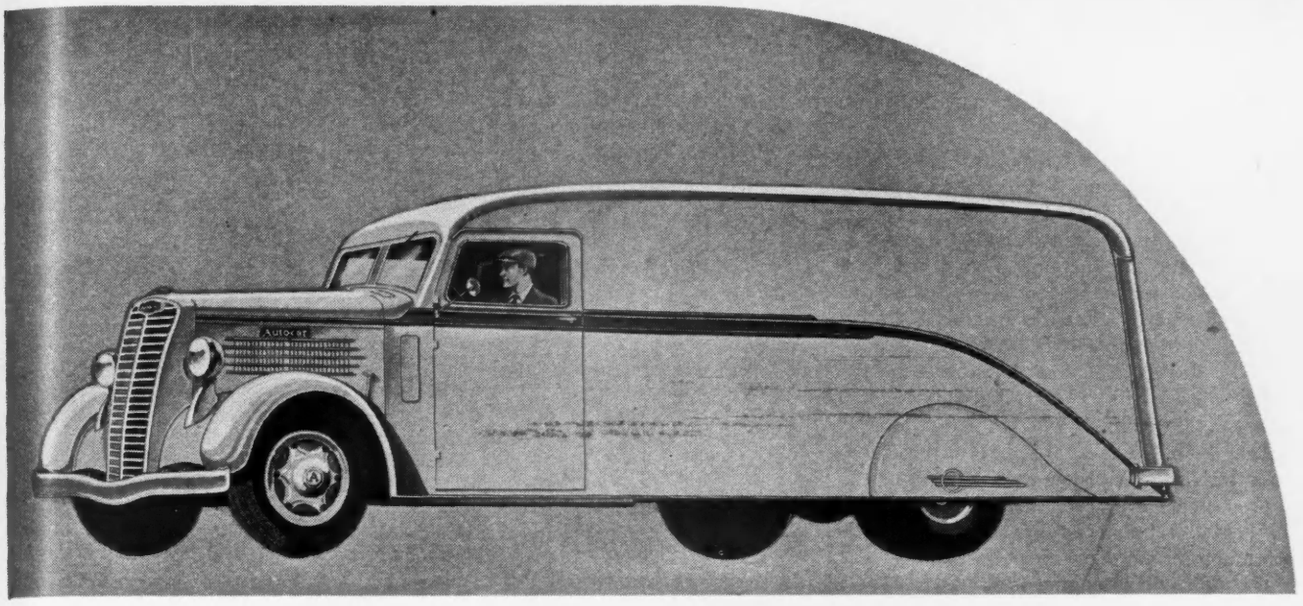
The regular line of standard and cab-over-engine models is continued.

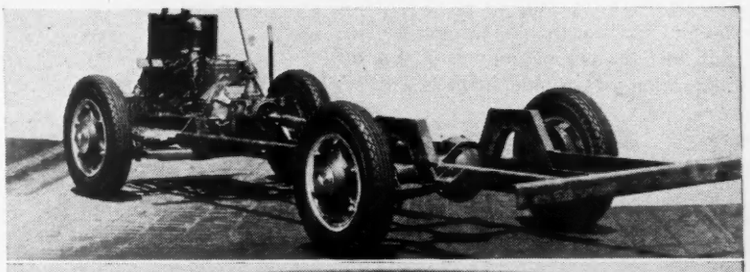
BANTAM

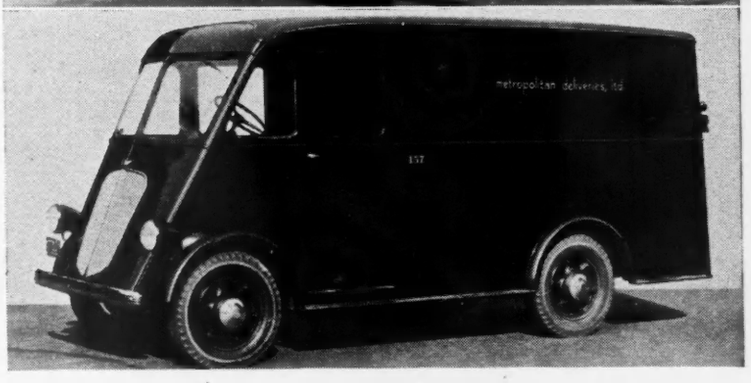
Commercial Models at $275 Feature Performance and Low Cost

THE new American Bantam is available in two commercial body styles—the ¼-ton truck chassis with panel body, listing at $395, and with pick-up body at $385. (Both bodies are pictured here.) The chassis alone is priced at $275.

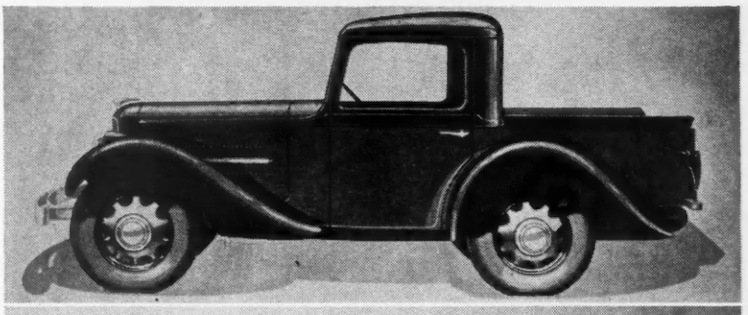
The American Bantam Car Co., Butler, Pa., says in its announcement that the Bantam has a speed in excess of 60 m.p.h., will run 45 to 50 miles on a gallon of gasoline, 30,000 to 40,000

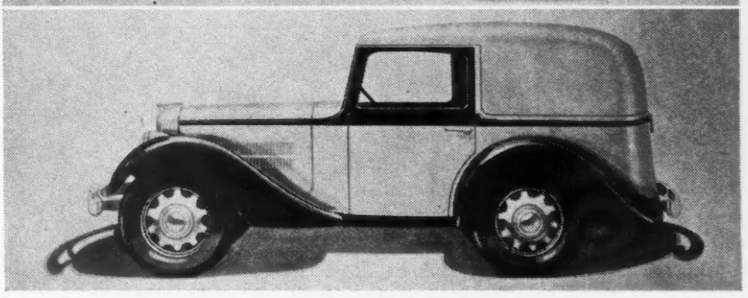






Above—Note grille work and cowl styling of Autocar's new model RL. Right—Available's drop frame delivery chassis model P-105 when equipped with four-cylinder engine. Below it is the same chassis equipped with a 10-ft. delivery body. At the bottom are Bantam's ¼-ton chassis with panel and pick-up bodies





miles on a set of tires, and will cost less than three-fourths of a cent a mile for gasoline, oil and tires. Specifications include the following:

Engine—four cylinders, 2.2 x 3, 45.6 cu. in. displacement, 20 hp. at 4000 r.p.m., alloy cast-iron cylinder block, aluminum barrel-type crankcase, cast nickel-steel pistons with three compression rings and one oil ring, nitralloy piston pins, nickel-steel drop-forged connecting rods, chrome-nickel steel inlet valves, silicon-chromium steel exhaust valves, and cast camshaft.

Rear axle is of the semi-floating type. Steering is through a worm-and-sector gear fitted with anti-friction bearings. Service brakes are four-wheel internal type applied by cables. Tread is 46 in.; overall length, 120 in.; overall width, 56 in.; overall height, 60 in.; ground clearance, 8 in., and weight with coupe body is 1200 lb.

Passenger-car models are the business coupe, listing at $335; de luxe coupe, $385; standard coupe, $365; standard roadster, $385, and custom-built roadster, $445 up. Special equipment and the standard accessory group are extra on all models.

DIAMOND T

Two Diesel-Powered Trucks—the D20 at $2150 and D30 at $2750

THE Diamond T Motor Car Co. of Chicago, Ill., announces two new diesel models, which are stated to be the first light-weight high-speed diesel trucks ever put into production. The diesel line will consist of the 1½-3-ton Model D20 with a base chassis price of $2,150, and 2½-4-ton Model D30 priced at $2,750. The D20 has a gross weight rating of 13,000 lb. and the D30 a rating of 17,000 lb.

The diesel engines are of the Hercules DJX series, models that represent improvements over the high-speed diesel engines announced by the engine manufacturer early this year.

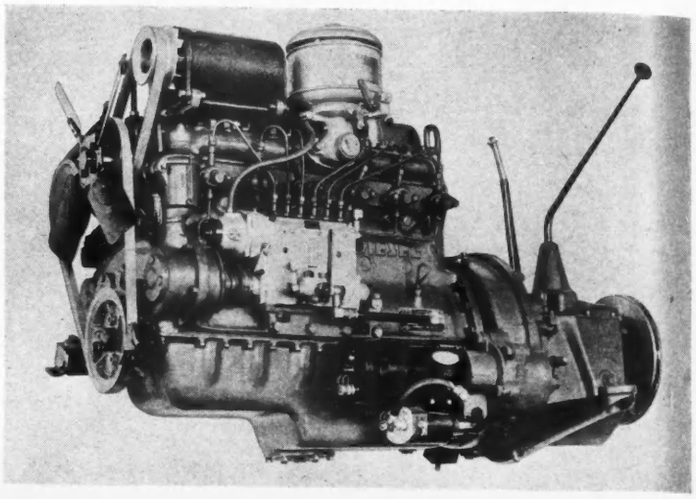
The Model D20 engine is the DJXB 3½ x 4½ with an A.M.A. rating of 29.4 hp. The piston displacement is 260 cu. in., maximum torque is 178 lb-ft. and the engine delivers 77 hp. at 2600 r.p.m. The Model D30's engine is the 3¾ x 4½ DJXC with an A.M.A. rating of 33.75 hp. Piston displacement is 298 cu. in., maximum torque 208 lb-ft. and it develops 86 hp. at 2600 r.p.m.

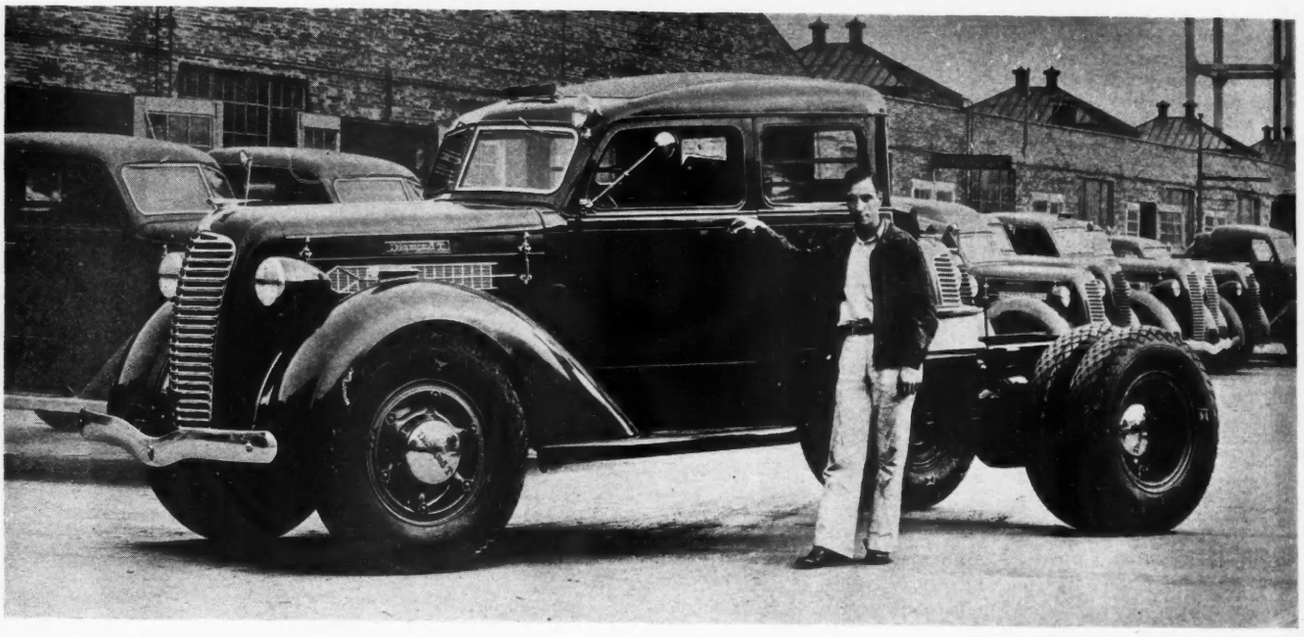
Both engines secure unusually clean and efficient combustion by use of a patented high-turbulence auxiliary combustion chamber. Alloy iron and steels are freely used throughout the engine.

Cylinder block and upper crankcase are cast in one piece of electric furnace molybdenum iron. Crankshaft is exceptionally rigid and heavy, 3 in. in diameter, and carried in seven large main bearings. Main and rod bearings are of the interchangeable precision type. Water pump is exceptionally large, and can be detached for servicing without affecting any other part.

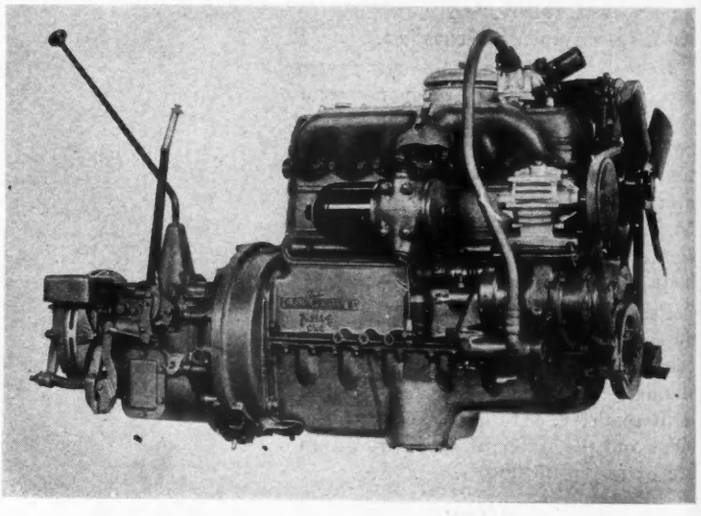
The Bosch injection system is employed with plunger type fuel pump, pintle-type nozzles, and vacuum governor. Oil bath air cleaner and recirculating type thermostat are standard equipment. Rubber engine mounting of a new design is a special feature providing almost complete absorption of engine vibration.

Going from the engines to a general discussion of the two models, it is





Illustrating on this page—Diamond T Model D20 with its Hercules DJXC diesel, both sides shown



found that the frames are of pressed steel with pressed side walls of exceptional depth and alligator jaw cross-members. They are individually designed for each wheelbase, with quarter-inch stock and six cross-members, the front members being extra wide to prevent wearing.

BOTH models have heavy full-floating two-speed rear axles, providing a choice of axle reductions that can be used at any time, combined with the entire range of transmission speeds. In the D20 the rear axle ratio is 5.14 to 1 in the high range and 7.15 to 1 in low.

For the Model D30 two combinations of ratios are available. The fast axle gives a reduction of 5.62 to 1 in the high range with exceptional fuel economy and a top speed of approximately 48 m.p.h.—combined with a reduction of 7.65 to 1 in the low range, providing much greater pulling power for grades or soft roads. The slower axle offers a reduction of 6.43 to 1 with a top speed of 42 m.p.h. combined with a ratio of 8.74 to 1 for use under severe conditions.

Lockheed internal expanding hydraulic brakes are on all four wheels with power operation by latest type B-K vacuum booster.

Four wheelbases are provided for each model, 139¾ and 151¾ in. for bodies measuring up to 11 ft. in length, and special wheelbases of 163¾ and 175¾ in. (at extra cost) for bodies up to 14 ft. in length.

Trucks

DODGE

Conversion by Montpelier Adds Loading Space and Cuts Length

INCREASED loading space and reduced overall length which give greater ease of handling in traffic and at the loading platform are among the distinctions of a new "cab-over-engine" conversion just announced by the truck sales division of Dodge. The cab and conversion are by Montpelier and are mounted on a Dodge chassis.

The conversion can be had on Dodge LF series 1½-ton chassis in all standard wheelbases and also in special wheelbases from 108 in. up. The 129½-in. wheelbase offers a C-A dimension of approximately 81 in., which is recommended for a 12-ft. body.

The cab is of full de luxe type with streamline front and with roof and cab corners fully rounded. Cab dimensions are 62 in. high from top of chassis frame to outside top of cab; overall width, 80 in.; coach type doors, approximately 31 in. wide by 62 in. high. Ventilation is provided by ventilating glass in side doors, ventilators located in each front corner of the cab and roof type ventilator.

The front end of the chassis is of heavy-duty construction to take care of the redistribution of load in the chassis. A heavy-duty steering gear with 18 to 1 ratio is supplied. All items are so arranged that complete accessibility is offered for service.

Illustrations top to bottom are Dodge camel-back conversion described on this page; Brockway and Waukesha-Hesselmaned Condor

FEDERAL

Four Cab-Over-Engine and One Delivery Model Added to Line

IN addition to its line of conventional truck models ranging from ¾ to 7½-ton capacity, the Federal Motor Truck Co., Detroit, Mich., offers for 1937 four new cab-over-engine models, and a new special model for milk delivery and other kinds of frequent stop service.

The cab-over-engine models incorporate the many advantages that give this type of vehicle a very definite place in present-day hauling operations. They are offered in the following models and capacities:

Model	*Rating Tons*	*Gross Weight (lb.)*	*Base Price**
75	1½-2	11,000	$1,045
80	2-3	13,000	1,395
85	2½-3½	14,500	1,595
89	3-4	16,500	1,995

*At factory for standard short wheelbase chassis. Standard tires and standard equipment, not including cost.

Each of the above models is built in wheelbase lengths of 104, 120, 132, 145 and 159 in., with corresponding loading spaces of 92, 119, 143, 167 and 191 in. These wheelbase lengths are approximately 3 ft. shorter than the conventional Federal models of similar capacities, while the loading spaces remain about the same.

They are in no sense a conversion of the standard conventional Federal trucks, but are new, completely designed vehicles. The cab, which is only 4½ in. higher than on the standard models, is well forward over the engine. The engine is located in what is virtually a "wind chute," which quickly dissipates engine heat. A heavily insulated steel cover over the engine keeps heat out of the driver's compartment. Two large cowl ventilators are provided.

The cover over the engine can be quickly removed, making this unit accessible for adjustments and minor servicing. An extra long bayonet type oil gauge makes it easy to check the oil level. Oil and water are added via the filler cap at the top of the cowl.

A pleasing appearance for this type of vehicle has been achieved through the design of the front end which is extended forward from the cab, rounded and fitted with an attractive grill. The Federal-built cab is 71 in. wide and 43½ in. deep from back of cowl to rear. Doors are 32 in. wide.

The driver's seat is 21 in. wide and the opposite seat is 17 in. in width. All controls are placed for easy driving.

These new models are powered with Hercules L-head seven-bearing engines. Complete specifications are published elsewhere in this issue.

The new Federal truck for milk delivery and other similar kinds of service, known as Model 9, is rated at ¾-1 ton with a gross allowable weight of 7000 lb. It comes in two wheelbases: 105 in. and 121 in. Prices are $625 for the short, and $695 for the long wheelbase. It has a four-cylinder engine with a 3⅜-in. bore by 4-in. stroke, a displacement of 143.1 cu. in., and develops 33 hp.

Extra sturdy construction has been employed throughout the Model 9 chassis. The majority of the parts and units are oversize for a truck of this capacity, so as to stand the abuse of delivery service and give long life with low maintenance cost.

Among the important chassis features are: Four-speed transmission, roller bearing universal joints, Timken front and full-floating rear axles, four-wheel hydraulic brakes and rubber-bushed spring eyes and shackles. Standard tires are 6.00/20.

There is available for the Model 9 a Federal-built body designed for milk delivery, but which can be adapted to other kinds of frequent stop service. It is furnished in two lengths. The body for the short wheelbase chassis has a capacity of 30 cases of milk, and for the long wheelbase chassis, 40 cases. Folding doors, a step-well on each side, a swivel seat and galvanized steel lining are special features.

The short wheelbase Model 9, complete with the 30-case milk body described, sells for $995, and the long wheelbase chassis with 40-case body is $1,035, complete at the factory.

GRAMM

Five New Diesel Models for 1937 List from $1995 to $3195

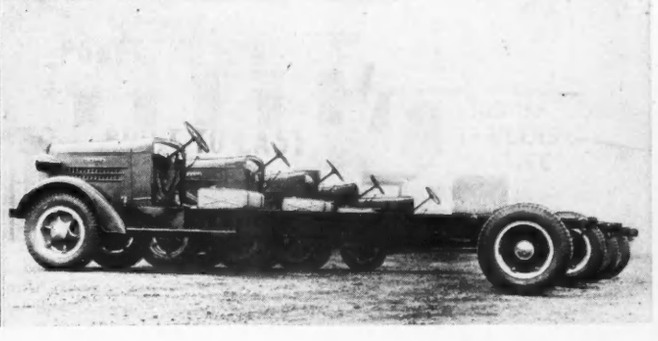
GRAMM MOTOR TRUCK CORP., Delphos, Ohio, now has five diesel models in its line in addition to the 10 gasoline-engined models. The DJX-40A with gross rating of 13,000 lb., lists at $1,995; the DJX-55A, 15,000 lb., at $2,595; the DJX-70A, 17,000 lb., at $2,845; the DJX-75A, 18,000 lb., at $2,995, and the DJX-85A, 20,000 lb., at $3,195.

The first three have the Hercules DJXB diesel engine and the other two the Hercules DJXC diesel. Engines are completely equipped with glow plugs and 12-volt electrical equipment for easiest possible starting in all kinds of weather. Complete specifications on the entire Gramm line will be found in the October specifications table.

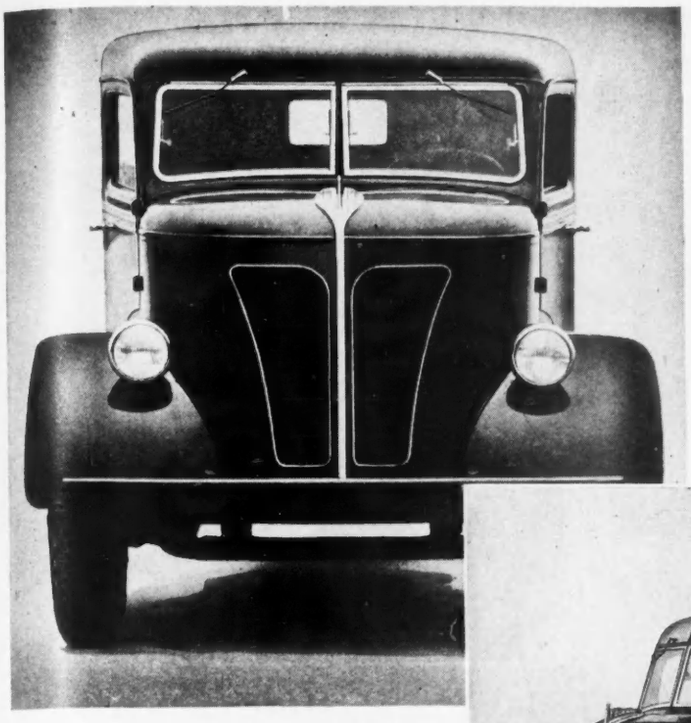
Compression type rubber shackles have been made standard equipment

GMTC'S contribution to the low price field has snappy styling

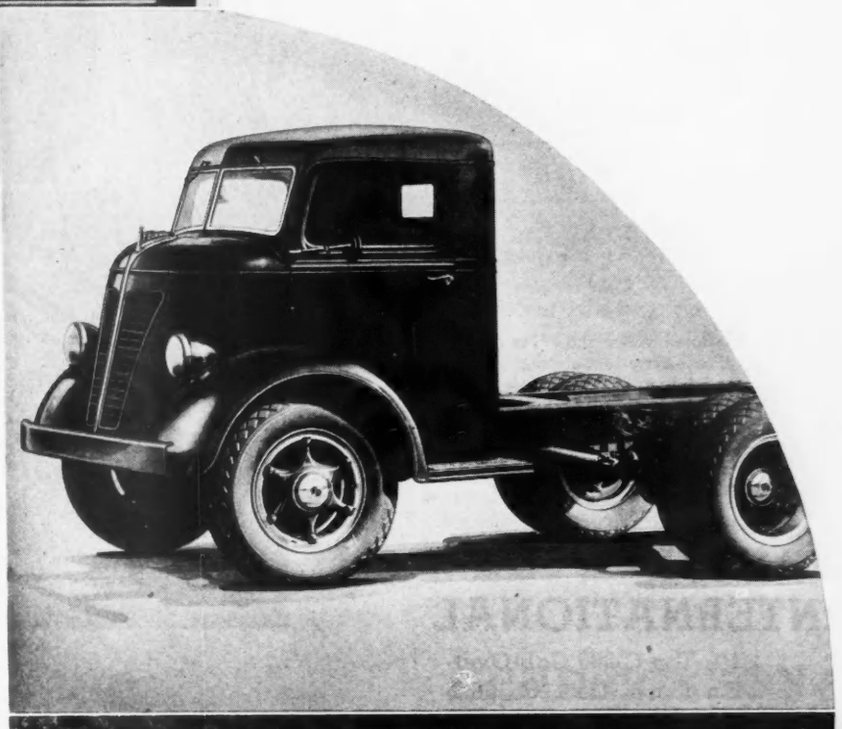
A line-up of Gramm chassis powered by Hercules diesel engines



Trucks

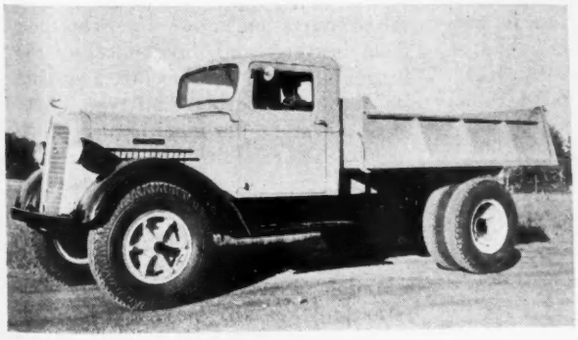


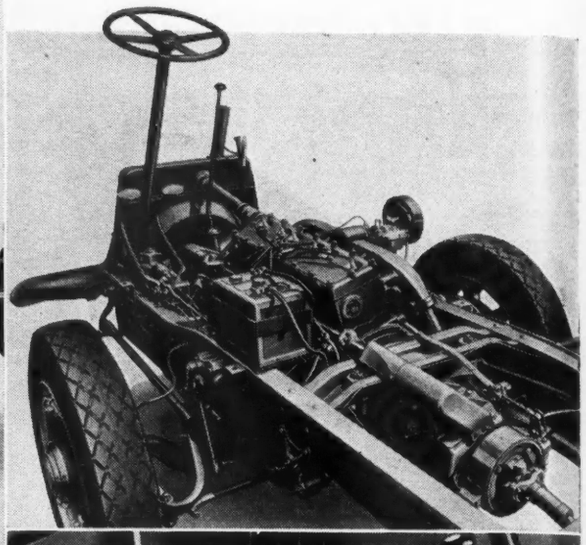
Federal's smart camel-backs are available in four sizes: model 75, 1½-2 tons; model 80, 2-3 tons; model 85, 2½-3½ tons; model 89, 3-4 tons. Model 9, 105-in. wheelbase delivery truck is shown below.

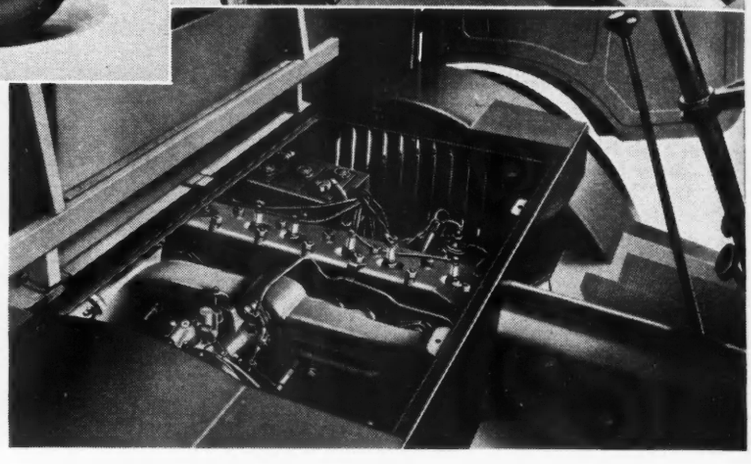


on both ends of front springs. The rear springs are rubber mounted at the front end, the rear end sliding on a hardened insert. The radiator mounting is three-point support, rubber-cushioned and spring-dampened. Radiator braces now are used at both top and bottom. Fenders have been changed in design, the front end dropping lower than heretofore. They are regularly equipped with valance. The instrument panel is finished in black crackle lacquer with chromium-plated instruments. An attractive and comfortable coupe cab of Gramm design is available.

Showing styling of the Gramm line of trucks for 1937







These International views show the engine mounting, accessibility under the driver's seat and cab styling of IHC's new model C-300 cab-over-engine chassis

INTERNATIONAL

1½-Ton C-300 Cab-Over-Engine Lists at $695

INTERNATIONAL HARVESTER Co. OF AMERICA, Chicago, Ill., announces a new cab-over-engine truck of 1½-ton rated capacity known as the Model C-300, and listing at $695. It is designed to meet modern requirements of greater load space with less overall length, better load distribution, and easier maneuverability. The driver is seated directly over the engine. Heat and fumes pass out beneath the seat at the rear of the cab.

The Model C-300 is available in 99 and 117-in. wheelbases and is adapted to body lengths up to and including a maximum of 15 ft. With bodies of this length, the reduction in overall length over conventional units suited to the same body sizes is approximately 3 ft. Weight distribution is one-third to two-thirds.

The frame is well reinforced. The spiral-bevel gear-drive rear axle has full-floating axle shafts, and one-piece banjo-type housing. The use of this housing, which is made by a one-piece steel tube, permits relative light weight, while the material employed is heat treated and assures a high degree of strength and load-carrying capacity. All rear-axle gears are nickel-steel forgings, case hardened.

The pinion is straddle mounted in the differential carrier on two tapered roller bearings with a straight roller bearing at the inner position. The four-pinion differential is carried in a cast-steel housing which is supported in two tapered roller bearings in the differential carrier. The axle shafts are chrome-molybdenum steel. Rear axle ratios are 5.285 to 1, 6.166 to 1, or 6.6 to 1.

Model C-300 front, rear and auxiliary rear springs are silchrome-manganese steel. Special attention has been given to the design of the front springs and the heavy-duty front hydraulic shock eliminators to assure easier riding.

Service brakes are internal-expanding, two-shoe, hydraulic type. The hand brake is of the external-contracting type mounted immediately back of the transmission.

THE power plant of the C-300 is a six-cylinder L-head engine, 3 5/16-in. bore and 4⅛-in. stroke. It develops a maximum brake horsepower of 78.5 at 3400 r.p.m., and a maximum torque of 151 lb. ft. at 800 to 1400 r.p.m. Piston displacement is 213 cu. in. and the compression ratio 5.7. The four main bearings and the connecting rod bearings are of the steel-backed babbitt-lined replaceable shell type. Other engine features include hardened exhaust-valve seat inserts, improved manifolding, single-venturi-horizontal-type carburetor, wire-wool type air cleaner, and vacuum spark control. The clutch is of the single-plate type with built-in vibration damper. The transmission ratios are low, 6.4 to 1; second, 3.09

Trucks

to 1; third, 1.69 to 1; high, 1 to 1; reverse, 7.82 to 1. A power take-off opening is on the right-hand side. The design of the engine mounting permits removal of the unit powerplant for major service operations by lowering the powerplant and removing it from underneath the cab and frame.

Ready access to the engine for minor service operations is provided through a removable, heat-insulated cover plate in the seat box. Floor boards are also removable to permit servicing the water pump and other assemblies.

The 18-in. diameter four-blade fan is driven by an extension shaft coupled directly to the crankshaft. Its location and mounting assure proper circulation of air over and around the engine and also eliminates the entrance of engine heat into the cab.

The streamlined cab has a sloping two-piece V-type windshield, attractive radiator grille design, and unusually wide doors. The design permits location of the seat box directly over the engine, and the location of the floor boards in front of the engine makes possible an overall height much lower than is ordinarily possible.

All metal parts of the cab that are immediately above the engine and chassis, including the seat box, seat box cover, and floor tunnel, are built of two pieces of sheet metal, between which is a ¾-in. thickness of heat insulating material to reduce the possibility of heat being conducted from the engine into the cab. Floor and toe boards are of wood covered with a thick rubber mat.

Fenders of the one-piece roll type and the short pressed steel entrance steps are a part of the cab. There is room in the cab for three men.

Available also, and especially suitable to public utilities and others engaged in construction work where trucks with special equipment are required, is a seven-man cab similar in appearance to the standard cab but having in addition another seat, amply wide for workmen, immediately behind the regular driving compartment.

HUG

Diesel-Powered Lugger Has Welded I-Beam Frame

THE Hug Co., Highland, Ill., has a new model in its Model 30 Hug Lugger, equipped with "Show Down" "Caterpillar" diesel power. This new Lugger model has a payload rating of 30,000 lb. and is equipped with a 10 cu. yd. capacity power hoist body. The body is the Hug Scoop End Type Body with high dumping angle hoist.

An innovation in design and construction in the Model 30 is the all electrically arc-welded I-beam frame. Trusses, spring hangers, motor hangers, radius rod braces, box section cross members are all electrically arc-welded to the side rails, forming one massive rigid structure.

The engine is the Caterpillar D8800 diesel, four-cylinder, four-cycle, 5¾ x 8, for a displacement of 831 cu. in. Brake horsepower is 85 at 1050 r.p.m.

Other features of construction, in addition to the "Caterpillar" diesel engine, are the side mounting of driver's seat, extremely short wheelbase, 12-speed forward, three-speed reverse transmission, heavy-duty double reduction full-floating type rear axle, and air-actuated steering.

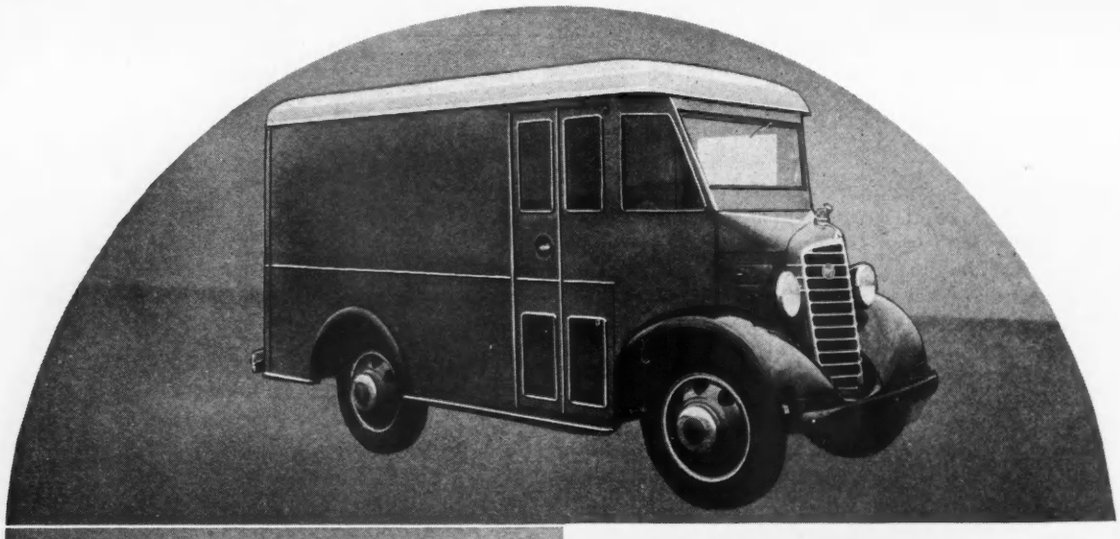
HENDRICKSON

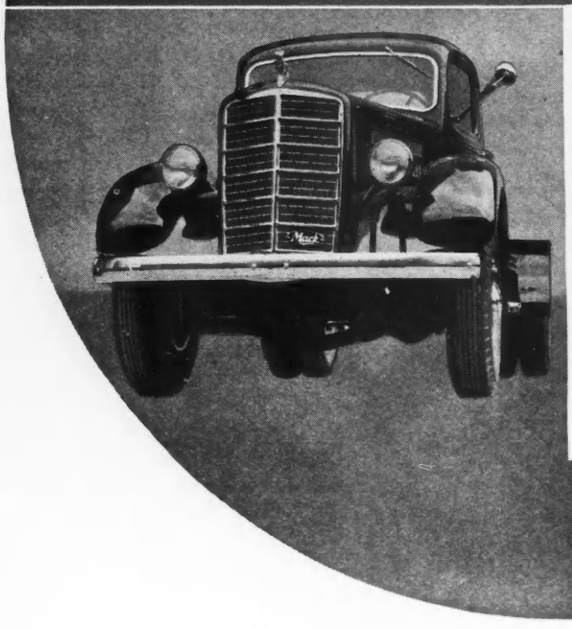
Restyling of Front-End Features New Type Hood

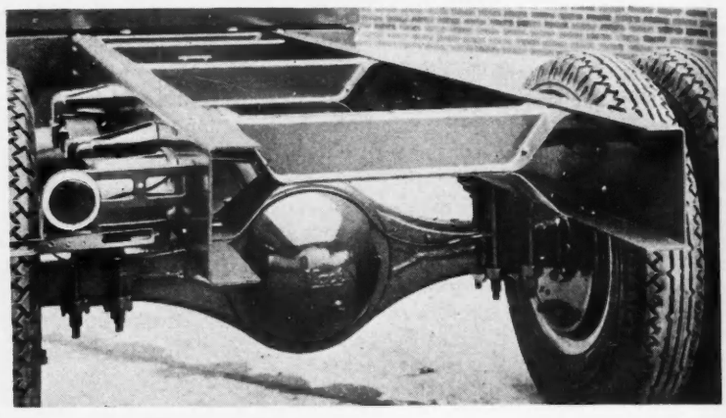
THE Model 37-21 introduces a new and distinctive styling to the line of the Hendrickson Motor Truck Co., Chicago, Ill. With this new front-end styling the hood lifts up, as in the case of several well-known passenger cars, to expose the engine.

In the case of the job pictured on this page, the chassis weight is 8000 lb., the cab weight 700 lb., the body and hoist 4000 lb., and the payload is 20,000 lb. It has a double-drive Hendrickson unit in the rear, three-speed auxiliary transmission and differential lock. The powerplant is a Waukesha 6BK.

Left—(top) Hug lugger equipped with power hoist body has 30,000 lb. payload capacity. Bottom—Hendrickson model 37-21 showing new styling







LeB.-SCHACHT

4 CU Camel-Back Models Start at $1650; Series A Line Restyled

FOR 1937 the LeBlond-Schacht Truck Co., Cincinnati, Ohio, has a new line of series A conventional models and a CU series of cab-over-engine models. Prices of the former begin at $995 and of the latter at $1650.

The series A models are available in eight capacities ranging from 1½ to 5½ tons. This series supersedes series B, the principal changes being improved appearance and streamlining as well as refinements in detail. Rubber spring shackle bushings are now a standard feature. Other improvements include a modified V-type radiator, improved fenders, heavier bumper, dome light in cab, shatter-proof glass and air suspended vacuum boosters. Each model is available in a wide range of wheelbases from 130 to 175 in. with longer wheelbases available at additional cost. Four different Hercules engine sizes are used, ranging from 263 to 383 cu. in. Five speed transmissions of the direct or overdrive type are optional in all sizes from the 2½ ton up. Timken axles, front and rear, are used in all models with beveled or double reduction gear optional. A two-speed axle is available on the 1½ and 2-ton models.

In the CU cab-over-engine series, the same chassis units are employed in sizes corresponding to the conventional models excepting, of course, heavier front axle, springs, tie rod and other units, since a greater percentage of weight is placed on the front end. For the present the cab-over-engine series embraces four models ranging from 2½ to 5½ tons. Wheelbases range from 91 in. for a tractor or 8-ft. dump, to 166 in. for an 18-ft. commercial body.

One of the features of the Schacht cab-over-engine design is the easy removability of the cab, permitting access to the engine and other working parts. The special cab design (patent applied for) permits sliding the cab forward on rollers which contact a subframe built into the main frame for that particular purpose. The rollers on the cab are inactive and engage only when the front of the cab is slightly raised. The width of the Schacht cab is 84 in.

MACK

Two New Traffic Models and a Route Truck Complete Line

THE Mack-International Motor Truck Corp., Long Island City, N. Y., is prepared for 1937 with new models recently introduced and with refinements in models that are being continued.

New Mack models include the EH, smaller and lower in price ($2250) than any previous Mack. With a gross rating of 18,000 lb. it has been styled to the modern mode with streamlined

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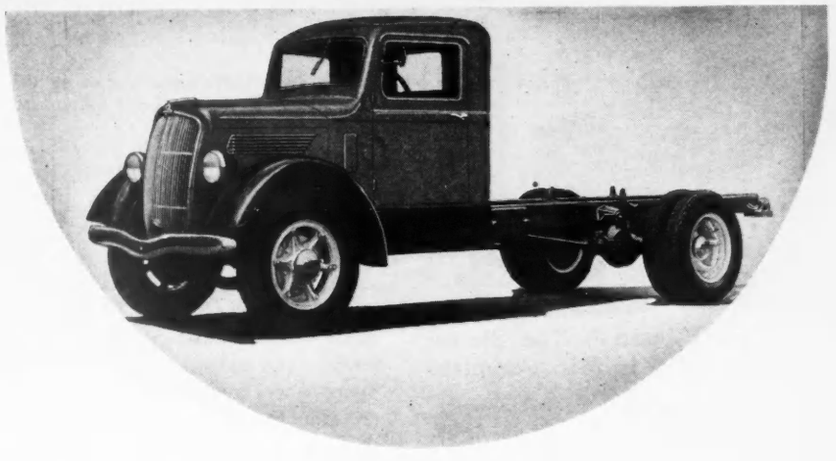
hood, cab and fenders, brilliant chromium radiator grille and hub caps and full inclosed skirting. Its engine is similar to that used successfully in the Model BG for several years. The frame is 8½x3¼x¼ and because of its large section modulus departs from Mack practice in being made of unheat-treated carbon steel. It is strongly braced, has five cross members, three of which are of large-section, rectangular and hollow with triple alligator-jaw riveting to the side-rails.

Opposite page — Front and rear views of Mack's EH model showing styling and frame construction, and the new route model. Below, left —Sterling's service tractor with tilting cab for engine accessibility. Below right— LeBlond-Schacht cab-over-engine CU model and below it is shown the new styling of the conventional model



Models EC and EB have been added to the line to round out the selection of Traffic Type trucks. These are smaller editions of the CH and CJ and smaller in capacity.

A new and smaller six-cylinder Model BF chain-drive is similar to the shaft-driven BF.

Undoubtedly the most notable addition to the Mack line has been the incorporation of a popular-priced series of medium-duty trucks which complete the line from ½-ton capacity up to the capacity of the EH. The Mack Jr. models are in four sizes ranging in gross weight from 4500 lb. to 15,500 lb. The line includes two Traffic Type models and a brand new door-to-door delivery known as the Route model.

MARMON-H.

New All-Wheel-Drive V8 Lists at Less Than $1400 at Factory

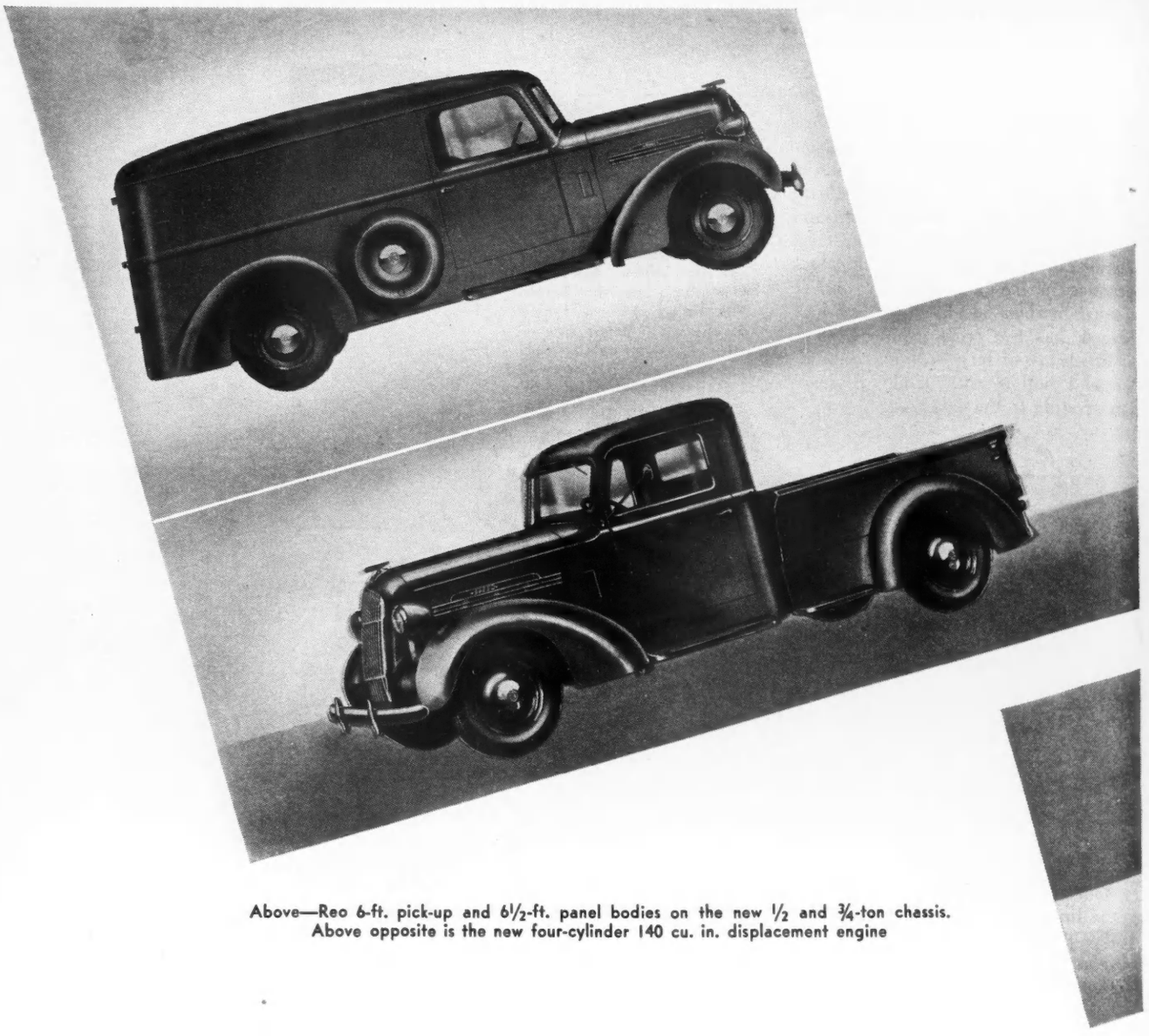
A NEW all-wheel-drive vehicle engineered and constructed for an entirely new field is announced by the Marmon-Herrington Co., Inc., Indianapolis, Ind., as an addition to its line of all-wheel-drive Ford V-8 models.

This unit consists of the Ford V-8 passenger, light delivery or commercial car chassis (112-in. wheelbase) into which are engineered and built Marmon-Herrington all-wheel-drive units such as driving front axle, four-speed transmission, transfer case, and semi-elliptic front springs. The result is the first light, powerful four-wheel-drive vehicle ever offered.

Known as Model LD1-4x4, it will have a factory list price of less than $1,400 and a permissible gross load, with 7.50 x 15 tires, of 4500 lb.

The driving front axle, of Marmon-Herrington design, is the full-floating single reduction type with constant velocity universal joint steering ends. The chief feature of the LD1-4x4 is that it can be used to carry passengers, haul material or pull light trailer equipment either on or off the highway.

The added traction and safety afforded by the driving front axle make possible operations over difficult terrain that would not be attempted by other light trucks or by any type of passenger car. At the same time, it can be used for "off the road" work ordinarily assigned to larger and more expensive vehicles.



Above—Reo 6-ft. pick-up and 6½-ft. panel bodies on the new ½ and ¾-ton chassis. Above opposite is the new four-cylinder 140 cu. in. displacement engine

REO

Adds ½ and ¾-Ton Series; Base Price is $555 Complete

AS the first step in its program of expanding its truck line, the Reo Motor Car Co., Lansing, Mich., has developed a new series of ½ and ¾-ton trucks. The base model, known as the Reo Speed Delivery, is equipped with all-steel cab with safety glass throughout, and has a list price of $555, complete with pickup body. It is available with a four-cylinder Reo Silver Crown engine for economy in multi-stop work, and a six-cylinder Silver Crown for fast highway transportation.

Wheelbases are 114 in. and 120 in., the latter priced slightly higher. The short wheelbase permits a 6-ft. pickup body or a 6-ft. 6-in. panel body, and the longer wheelbase a 7-ft. pickup and a panel 6 in. longer.

The new truck presents a modern, streamlined appearance with its chromium-plated radiator grilles, skirted fenders and individual running boards. Spare wheel and tire with metal cover are mounted on the right side back of the cab door. A 16-gal. gasoline tank is mounted at the rear of the frame. The pickup bodies have running board steps and side skirts conceal the frame. In the cab airplane-type instruments are grouped on the driver's side of the dash, and are matched on the other side by a large package compartment with lock.

The ¾-ton models have full-floating rear axles, heavier springs and larger tires, but otherwise are similar to the ½-ton series. The latter have a semi-floating rear, 10-in. clutch, three-speed all-helical transmission, full-pressure lubrication and hydraulic brakes.

The Reo four-cylinder engine is a new one of L-head design. It has a bore and stroke of 3 3/16 x 4⅜, piston displacement of 140 cu. in. and maximum brake horsepower of 45 at 2800 r.p.m. It is a small edition of the service-proved six-cylinder engine with the same bore and stroke.

Other Reo models have been restyled to conform in appearance to the new ½-ton, so that the entire line presents a uniform appearance. Outside of an increase in brake sizes, no fundamental changes have been made in the heavier duty models.

WALTER

New Six-Wheeler Four-Wheel Drive Has Unusual Rear Bogie

WALTER MOTOR TRUCK CORP., Ridgewood, Queens, L. I., has added a six-wheel model to its line of four-wheel-drive trucks. This six-wheeler has

Trucks

Above—Walter's six-wheel four-wheel-drive equipped with rear bogie allowing parallel wheel motion. Right top—Ward LaFrance cab-over-engine tank job. Right—Studebaker cab forward with special refrigerated ice cream body

a four-wheel drive. The drive is distributed to the front axle and the rear axle of the rear bogie.

Construction of the rear bogie is unusual. It provides parallel wheel motion the same as independently sprung wheels used on many passenger cars. The wheels on the one side can tilt and rock without any motion, either vertically or otherwise, to the wheels on the opposite side. Simplicity of construction characterize the bogie. There is only one cross axle, and that is a large tube located between the two rear wheels. This design is made possible by the Walter double reduction drive.

Like all Walter models, the new unit embodies the Walter four-point positive drive obtained through the use of three automatic lock or torque proportioning differentials. The front axle is set back characteristically and the frame is a drop type without kick-up over the rear bogie.

STUDEBAKER

Half-Ton Job Among Other New Units to Be Added in '37

NEW trucks, including a half-ton model, are being readied by the Studebaker Corp., Southbend, Ind., for 1937, but these will not be ready until after the first of the year.

Meanwhile the 1½-ton cab-forward model continues to enjoy popularity. It is finding a foothold in many locations. Studebaker's latest vocational innovation is a refrigerated ice cream job. This consists of a 500-gal. Batavia body with four Kold-Hold refrigerating units and a 1½ hp. Kelvinator compressor on the cab-forward chassis. The body is 142⅞ in. long and is mounted on a chassis with a wheelbase of only 125 in. It is insulated with 6 in. of Dry Zero in the walls and roof and 6-in. corkboard in the floor. Weight of the body equipped is 3700 lb.

WHITE

Line of Four Cab-Over-Engine Models Has Style and Utility

EXCEPTIONAL road stability, safety, handling ease and ideal load distribution with shortest over-all length are among the chief features claimed for a complete new line of cab-over-engine trucks announced by the White Motor Co., Cleveland, Ohio.

The new White c.o.e. line consists of four models—805, 809, 812 and 818. The mechanical specifications of each are balanced in the characteristic White manner. The models are graduated in size, weight and power, giving a wide range of capacities. A large group of optional features, such as wheelbases, transmissions, rear axle ratios and tire sizes, are available to meet the requirements of specific operations.

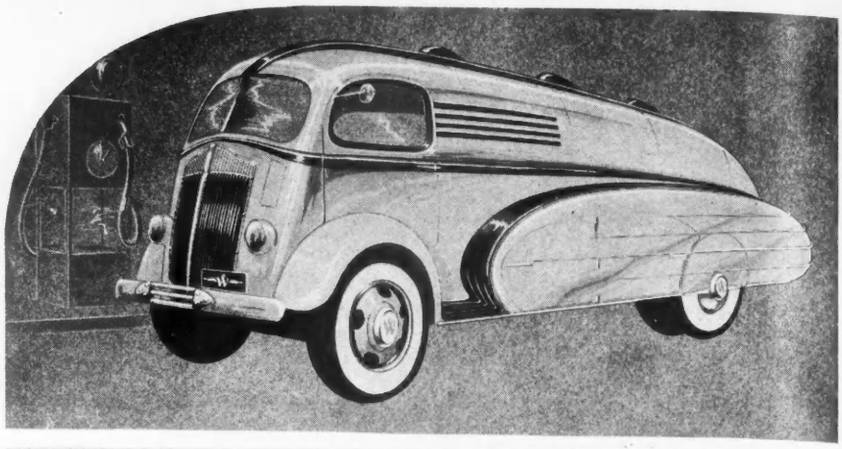
Detailed specifications are given in the Specifications Table supplement elsewhere in this issue. They show the following list prices: $1,650 for the 1½-2-ton Model 805; $2,240 for the 1½-3-ton 809; $2,850 for the 3-5-ton 812, and $3,275 for the 3-6-ton 818.

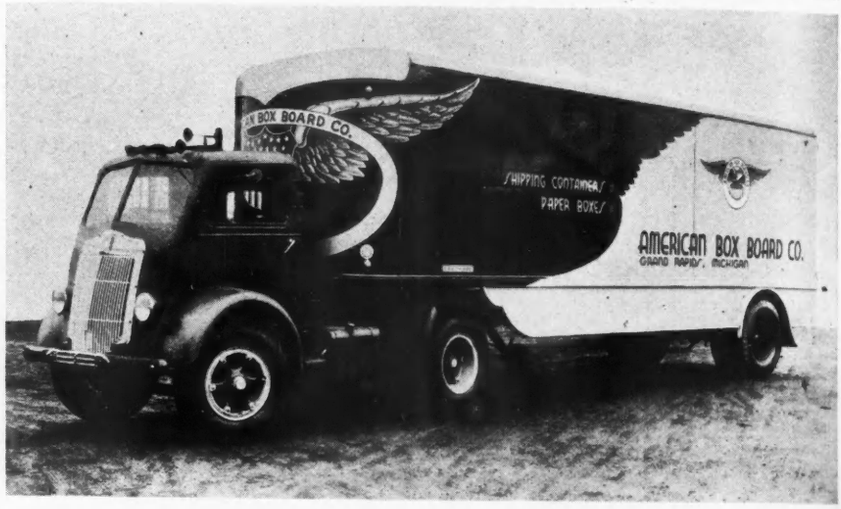
Several exclusive engineering innovations are incorporated in the new models, which have been designed throughout as c.o.e. trucks and contain no compromise with conventional truck design. The forward placement of the front axle, an unusually wide tread of almost 80 in., a rear opening (safety) cab with an overall height only a few inches more than trucks of conventional design are important features.

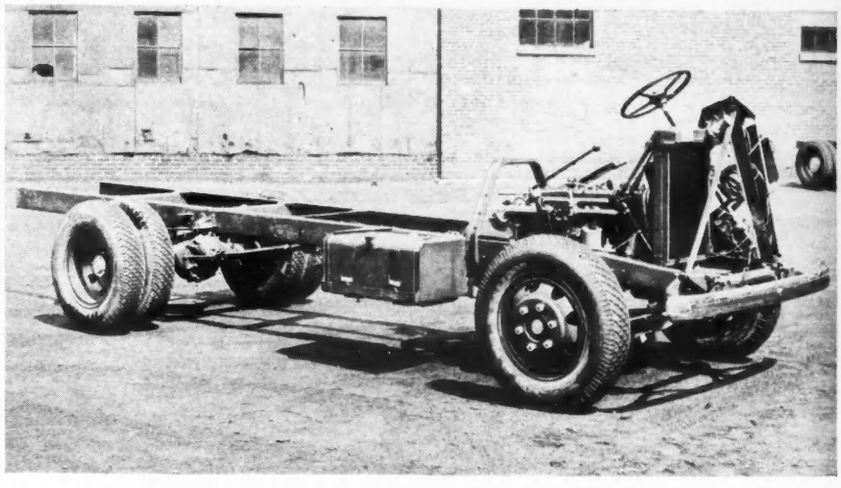
The forward position of the front axle, determined after exhaustive study of all desirable c.o.e. features, permits ideal weight distribution—1/3 front, 2/3 rear—with a shorter over-all length than other c.o.e.'s.

The unusually wide tread provides excellent maneuverability and handling ease, while shortening the turning radius to a minimum. The outboard spring design increases the distance between spring centers nearly 12 inches, an important factor in eliminating sidesway and bouncing, hitherto considered necessary evils in the c.o.e. design.

Unusually good accessibility for all servicing operations is a feature of the new Whites. Oil checking and filling, valve, fan, carburetor, distributor, generator and water pump adjustments are easily made with the engine in place and with minimum labor. For major overhaul, the engine, clutch, transmission, radiator, and handbrake easily slide out on a sub-frame as a unit assembly. Running tests on the engine assembly after overhaul can be made before the engine is slipped back.







An important feature of the new White c.o.e.'s is the rear opening cab for greater safety and driver convenience in backing. The forward positioning of the front axle permits hinging the door at the front. The cabs also are equipped with White's famous automatic air-conditioning devices. A positive ventilating system assures the constant circulation of fresh, clean air, while thick insulation on the floor boards and engine cover insures a comfortable, fume-proof cab both winter and summer.

"Rolling billboard" advertising value is provided in the new White c.o.e. models by their streamline styling executed by Count Alexis de Sakhnoffsky, internationally noted authority on streamlining who works exclusively in the truck and bus fields for White.

Trucks

WILLYS

Unusual Front-End Design Featured in Truck and Car Models

ALTHOUGH it remains in the low-priced class, the Willys for 1937 has been greatly changed in outward appearance—much to its advantage—and has again become a standard-tread vehicle. The new design is the work of Amos Northup. The well-rounded front of the engine compartment does not give any suggestion of a radiator behind it. Rows of chromium-plated louvers extend around the hood.

The new line of Willys-Overland Motors, Inc., Toledo, Ohio, consists of a five-passenger, four-door sedan and a coupe, both in standard and de luxe forms, with an overall length (over bumpers) of 175½ in., which is 11½ in. longer than last year's model. Tires are 5.50-16 in.

Also there are two commercial units—panel delivery and cab pick-up models. Inside length of the panel from back of front seat to inside of the rear door is 64¼ in. The inside width is 43 in. Inside width at the floor is 39¼ in.; width of the rear door opening is 35¼ in. The width of the cab pick-up is 40⅞ in.; the depth from rear end to back of cab 57 in., with 11¾ in. from the floor to the bottom of the flare.

The highest point of the curved roof is 65 in. above the road level. In the coupe the luggage space measures 38 cu. ft.

Disc wheels and large chromium-plated hub caps enhance the exterior appearance. The curved running boards are not anchored to the front fenders. The one-piece hood is hinged at the rear and is lifted in front. The one-piece windshield is sloped. Safety glass is used throughout.

The new models are finished in Dulux synthetic enamel and are available in six standard colors.

The front seat, which is 50 in. wide, is in one piece and adjustable. Bodies are of all-steel construction. The brake lever has been located under the cowl, to provide additional room for the driver.

There are two large chromium-plated dials at the center of the new instrument panel.

A NEW Gemmer steering gear has replaced the old one. Knuckle pins have been enlarged in diameter, to decrease the rate of wear of their bearings. Synchro-shift transmissions are used on all models. Clutch and brake pedals are now provided with lubricators, to prevent them from sticking on their shafts. The clutch-release bearing is of the self-lubricating type.

Bendix duo-servo four-wheel brakes are fitted. To eliminate the hazard of tire-chain interference, the rear brake cables are now placed inside the frame rails. Brakes are 9 in. in diameter and have linings 1¾ in. wide.

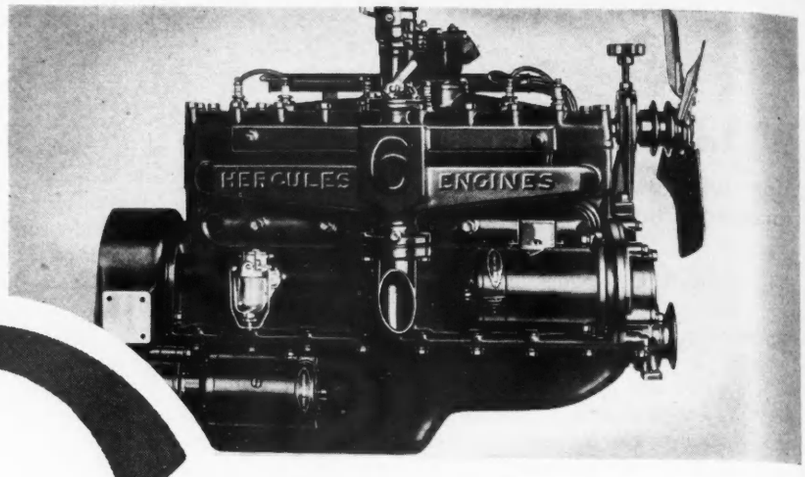
The four-cylinder Willys engine of former years is continued. It has a bore of 3⅛ and a stroke of 4⅜ in. and is rated 48 hp. at 3200 r.p.m. A Tillotson downdraft carburetor is fitted. Steel inserts are used for the exhaust-valve seats. Exhaust valves are of silicon-chromium steel.

The water pump and fan are a single unit mounted at the front of the engine and belt driven. The 13-plate USL storage battery is located in a compartment provided for it in the right front fender and is accessible when the hood is lifted. Other improvements in the way of engine accessories include a new intake manifold and a larger air cleaner and silencer.

The single-plate clutch and three-speed transmission are of conventional design. The former is the 8-in. size and has a spring damper. Movement of the clutch pedal is transmitted to the clutch by a flexible cable, so that engine vibration does not disturb the pedal. Inclination of the steering column can be varied to suit the driver's requirements.

Illustrations on page at left show various views of White's new cab-over-engine job

On this page the photographs reveal the unusual front-end appearance of the new Willys



Engines and ENGINE ACCESSORIES

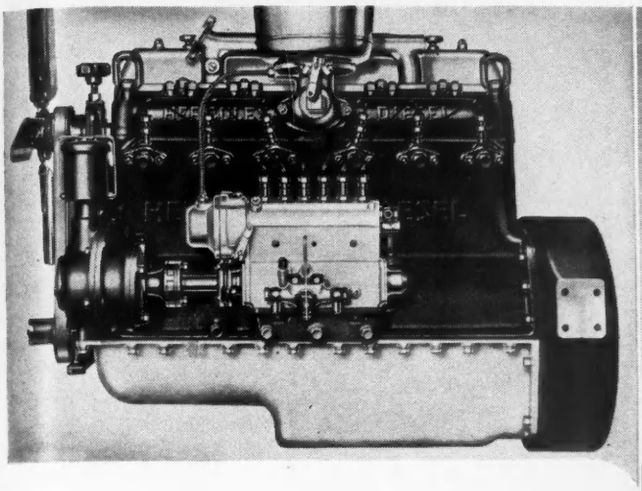
EVEN the amateur in motor vehicle operation realizes instinctively that the engine is the most important single unit of the vehicle. Proof of this statement can readily be obtained by taking a look around the automobile shows where doctors, lawyers and merchants gather to look over the new cars with the idea of purchasing one. Now doctors, lawyers and merchants are good men and desirable citizens but they know almost nothing about motor vehicle operation. Still they can be found in little groups around the cars where the hoods are up or standing at the rail watching the cutaway engine being driven by a ¼ h.p. electric motor. They listen to the pitchman and make a serious attempt to learn more about things automotive, with emphasis on the engine.

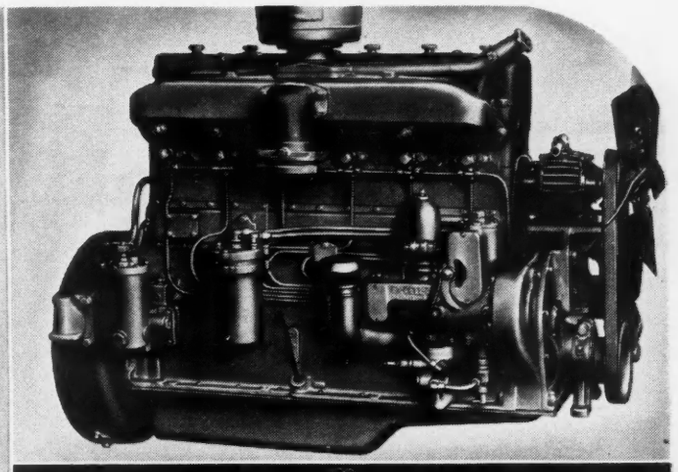
Education does not destroy this instinct and fleet men show the same interest in engines but their education and practiced eye demands more than the ordinary pitchman can give. They want to know about the weight, horsepower and torque. They are interested in the piston displacement and the accessibility for maintenance. A slightly different approach but the focal point is still the engine.

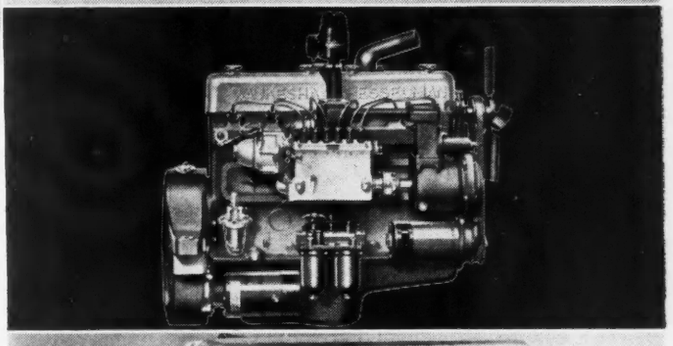
Neither the drought nor the election year has had a detrimental effect on engine production with the result that the output is a bumper crop, the harvest showing a number of new models. Any statistician can tell you about the size of the crop. This article will tell you about the new models.

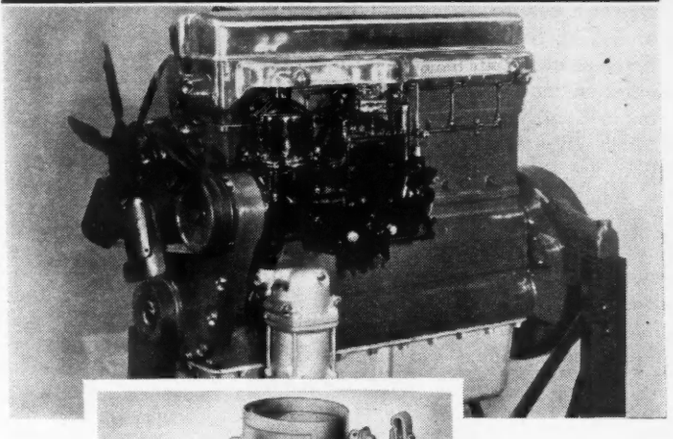
Engines

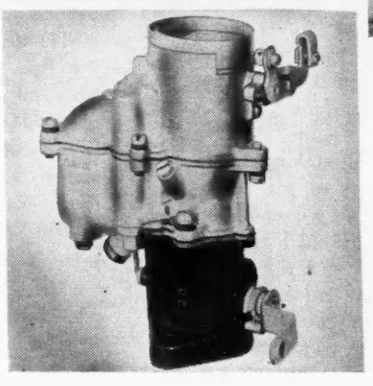
BEGINNING alphabetically with Buda the show season sees some new Diesel engines. All Buda engines will, of course, have the Lanova feature which is an hour glass shaped arrangement within the combustion chamber to aid in getting power from the combustion. Specifically the new engines are: the model 6LD-691, a six cylinder, 4¾x6½ in., 691 cu. in. engine. The cylinder block and crankcase is an integral casting and the cylinders lined with dry sleeves of alloy cast iron. The other new model is the 6LD-468. This engine has six cylinders of 4¼ in. by 5½ in. It has a horsepower peak of 115 at 2200 r.p.m. and a torque output of 345 lb. ft. at 1100 r.p.m. Continued is the 6LD-275, the baby of the Buda Diesel family. This healthy infant is a 3½x4¾ in. engine having 275 cu. in. of piston displacement and turning out 84 horsepower at 2600 r.p.m. and 200 lb. ft. of torque at 1300 r.p.m. In addi-











Illustrations from left to right are of Hercules gas engine, Hercules diesel, Buda diesel, Waukesha - Hesselman diesel, Cummins diesel and Zenith 20th century carburetor. The new Waukesha diesel, which arrived late, is illustrated and described on the next page

tion there is the big 525 cu. in. overhead valve gasoline engine which is being shown as an important part of the line.

NEXT on our alphabetical path among the year's engines is the Cummins booth. If you get away from this booth without having the merits of the Cummins injection system impressed upon you, you have not met one of the Cummins men. Cummins engines have a pump and injector of Cummins design and manufacture, a point which as you may have gathered, the Cummins Engine Co. wants you to know.

This injection system is applied to the AA-6, a six-cylinder engine of 331 cu. in. having a bore of 3¾ in. and a stroke of 5 in., a horsepower peak of 85 at 2200 r.p.m. and a torque output of 227 lb. ft. at 800 r.p.m. It is also found on the HA-4 and HA-6, four and six cylinder engines respectively of 4⅞ in. bore and 6 in. stroke. The four cylinder engine has 448 cu. in. of piston displacement, 83 horsepower at 1800 r.p.m. and a torque output of 285 lb. ft. at 900 r.p.m. The six cylinder engine has a piston displacement of 672 cu. in., 125 horsepower at 1800 r.p.m. a 425 lb. ft. of torque at 800 r.p.m.

DURING our pause at the Hercules exhibit we find that they are really going to town with the new QX series of light six cylinder gasoline engines. There are two sizes both having a 4⅛ in. stroke and one having 3⅛ in. bore and the other a 3¼ in. bore. The big one turns out 61 horsepower at 3300 r.p.m. and 134 lb. ft. of torque at 1000 r.p.m. The smaller engine rates at 55 horsepower at 3000 r.p.m. and 130 lb. ft. of torque at 1000 r.p.m. These engines follow characteristic Hercules de-

Engines and ENGINE ACCESSORIES

sign and have the usual sturdy qualities.

The two small Diesel engines in the DJX line which are interchangeable with the JX line of gasoline engines so far as mounting is concerned are now being offered as standard in several makes of trucks. The sizes of these engines are 260 and 280 cu. in. which puts them in the small Diesel class.

WAUKESHA has two new Diesels which will comprise its full Diesel line. One is a 462 cu. in. six-cylinder engine of 4⅜ in. bore and 5⅛ in. stroke. It develops over 100 hp. at 200 r.p.m. The other engine is a 5x5½ in. engine having 648 cu. in. of piston displacement which gives it 150 hp. at 2000 r.p.m. Both are known as Mark III Comets.

Both engines have seven main bearings and bearing material for both main and connecting rod bearings is steel backed cadmium silver. Main bearings are shimless. Dry cylinder liners are used with a square faced flange on the upper end holding them in place. The water jacket extends the length of piston travel on the smaller engine and the full cylinder length of the larger one. An oil cooler is built into the water jacket clean out plate of the smaller engine.

Bosch pump and injection system is used on both engines to get the fuel into a much improved combustion chamber. The new design leaves more space for cooling between the combustion chamber and the valve ports and in addition creates a greater turbulence which aids complete combustion. A new piston ring has shown complete freedom from sticking after running at full load 200 r.p.m. for 100 hours. Fuel is now filtered through waste packed Radial flow oil filter which has been previously used only for filtering lubricating oil. The smaller engine is governed by the Waukesha built centrifugal governor built into the timing gear train. The larger engine is governed by a governor in the fuel pump.

These Waukesha Diesel engines are

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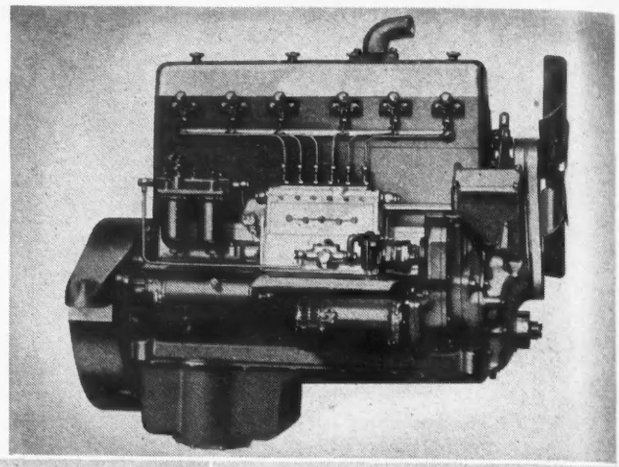
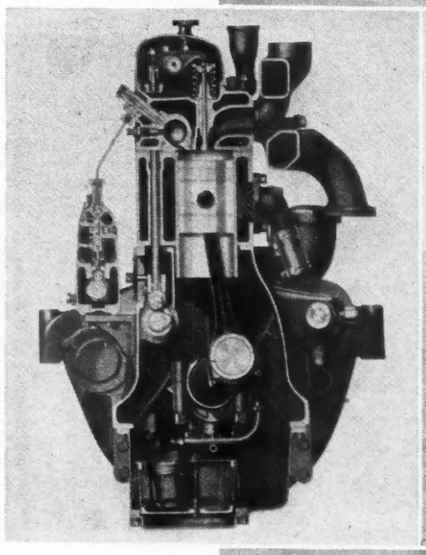
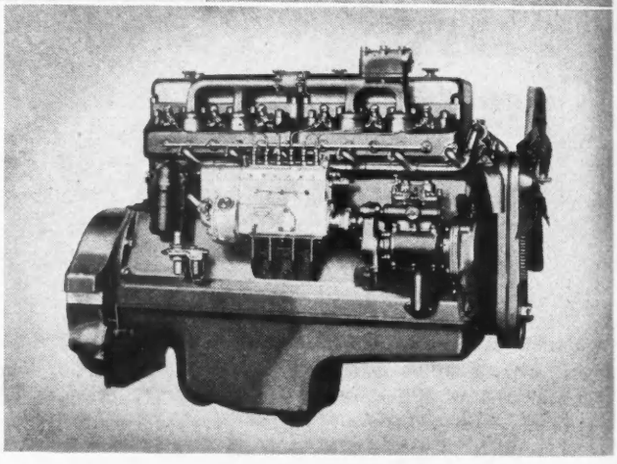






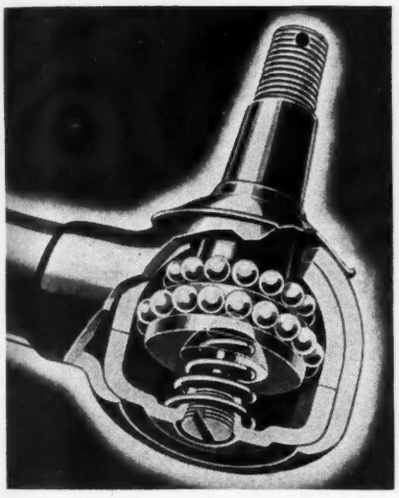
Top — Injection side view of the new Waukesha 6D-150-648 diesel. Above left—Section of the 6D-110-462 Waukesha diesel. Note oil cooler on inside water jacket inspection plate. Above right—Waukesha piston showing turbulence recesses. The two illustrations at the right show the ignition side view of the new Waukesha 6D-110-462 diesel and below it the combustion chamber detail. Bronze locking rings hold half cups in place

REPLACEMENT Parts

Tie-Rod Ends

PERMITE ball bearing tie-rod ends are said to overcome steering wheel play, hard steering, road wander, oversteering, shimmy, front-end rattles, and excessive tire wear. They are available for all popular makes and models of trucks, buses and passenger cars.

On these tie-rod ends, threads are not rolled or formed—they are machine cut and are identical with original equipment, insuring perfect fit and easy installation. Raceways are hardened and ground. Balls are forged from high carbon chromium steel. Accurate to limits of .0001. Housing is



not cast, but formed steel in the small sizes, and a steel forging in the larger sizes. Aluminum Industries, Inc., Cincinnati, Ohio.

Spring Shackle

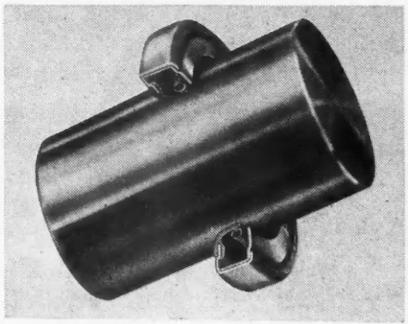
ROAD shocks are reduced and squeaks eliminated by a special Harris-type spring shackle for Ford V-8 cars, a product of Thompson Products, Inc., Cleveland. The shackle consists of two hollow pins tapered at the ends and set in side-links containing cone shaped rubber bushings. This puts a ¼-in. thickness of live rubber around each pin end. Squeezed hard in the side links by two drawn-up bolts, they handle all flexure of the car springs and the effect is for the rubber to force the working shackles always back to the normal spring position. These shackles list at $1.25 each and are boxed in pairs for front or rear springs.

Amco Brake Lining

AMCO brake lining for commercial vehicles achieves long life with few adjustments, soft pedal action, elimination of scored drums, squeaks and other noises, moisture and oil proof and elimination of "fade" or loss of stopping power, claims the manufacturers, The Asbestos Mfg. Co., Huntington, Ind. The special composition and quality of asbestos yarns and the manufacturing process is said to give the patented Amcobond lining these qualities.

Victor Oil Seal

THE Victor Mfg. & Gasket Co. has introduced a new type of oil seal or



grease retainer, in which the sealing member, or wipe, is hydraulically molded from DuPrene reinforced with fabric and vulcanized to the metal shell.

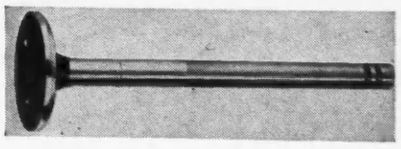
Among the advantages claimed for this seal are accuracy in the size and shape of the sealing member, thus permitting light contact with the shaft; thorough seal at high and low temperatures and at all speeds; resistance to the effect of oil; durability.

New Rich Valve

COMBINATION of a new heat and corrosion-resistant steel with hard, wear-resisting valve seats in a super valve has been announced by Wilcox-Rich Corp., of Detroit, a subsidiary of Eaton Mfg. Co. The new Rich Valve is made of Silcrome-X valve steel, an alloy having special metallurgical characteristics qualifying it for service at higher speeds with increased compressions and more powerful engine.

Permite Valve

IN the Permite Diachrome Valve, the valve head and upper stem are made of austenitic steel, that prevents distortion and corrosion. Its high resistance to the products of combustion promotes long seat wear. The high strength which this Valve possesses at elevated temperatures reduces the possibility of head draw. The lower stem of nickel-chrome steel affords the high degree of hardness necessary to resist stem wear and retain tappet adjust-



ment. Aluminum Industries, Inc., Cincinnati, Ohio.

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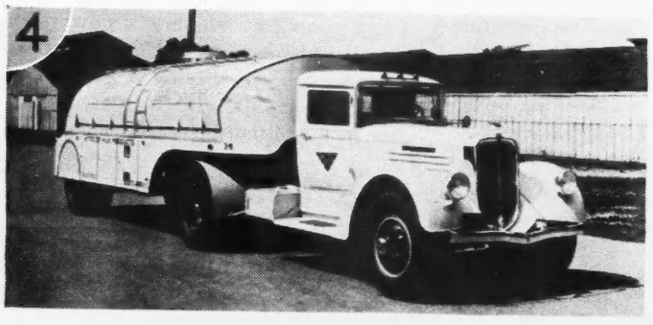

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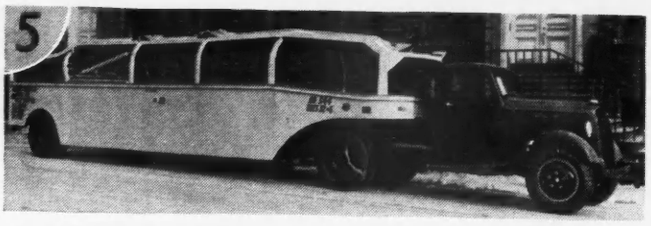

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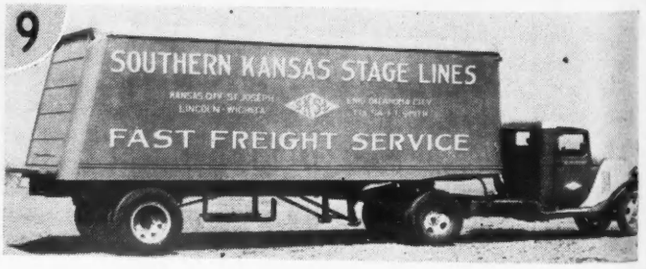
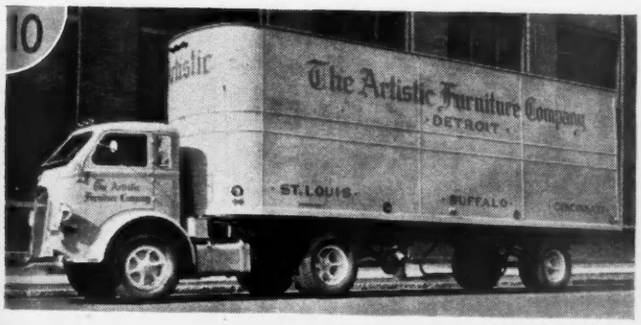
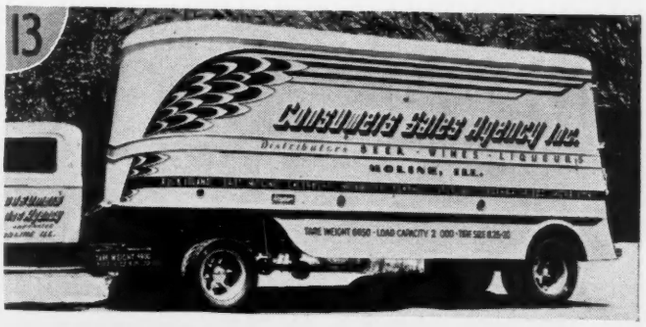
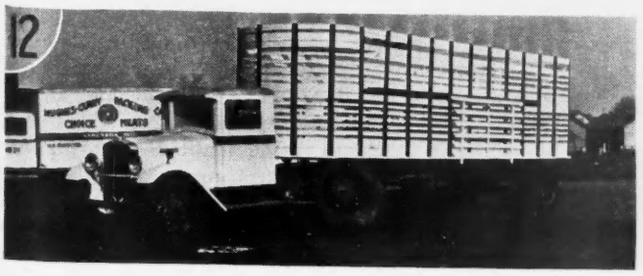


1. Dump trailer by Gramm Motors, Delphos, Ohio. 2. Modernistic panel body trailer by Highway Trailer Co., Edgerton, Wis.; tractor by Diamond T. 3. Special Trailmobile all-steel grain trailer by Trailer Co. of America, Cincinnati, Ohio; tractor by Reo. 4. Milk tank tractor-trailer unit by General Motors Truck Co., Pontiac, Mich. 5. Car-hauling trailer by Whitehead & Kales, Detroit, Mich.; tractor by Dodge. 6. Beer body trailer by Edwards Iron Works, Inc., South Bend, Ohio; tractor by Studebaker. 7. Freight trailer by Mack Trucks, Inc.; tractor is Mack Jr. 8. Ice Cream trailer (Universal) with insulated and non-insulated compartments by Fitz Gibbon & Crisp, Inc., Trenton, N. J.; tractor by GMT. 9. Freight trailer by Spencer Trailer Co., Augusta, Kan.; tractor by Chevrolet. 10. 1900-cu. ft. furniture van trailer by Fruehauf Trailer Co., Detroit, Mich.; tractor by Autocar. 11. Garbage dump trailer by Truck Engineering Co., Fort Wayne, Ind.; tractor by Chevrolet. 12. Livestock trailer by Premier Mfg. Co., Indianapolis, Ind.; Indiana tractor by White. 13. Modernistic trailer by Kingham Trailer Co., Inc., Indianapolis, Ind.—sides orange, wings black, lettering silver. 14. Oil tank trailer by Utility Trailer Mfg. Co., Los Angeles, Cal. 15. Refrigerator trailer by B & J Trailer Co., Chicago, Ill.; tractor by White.

Trailer ALBUM







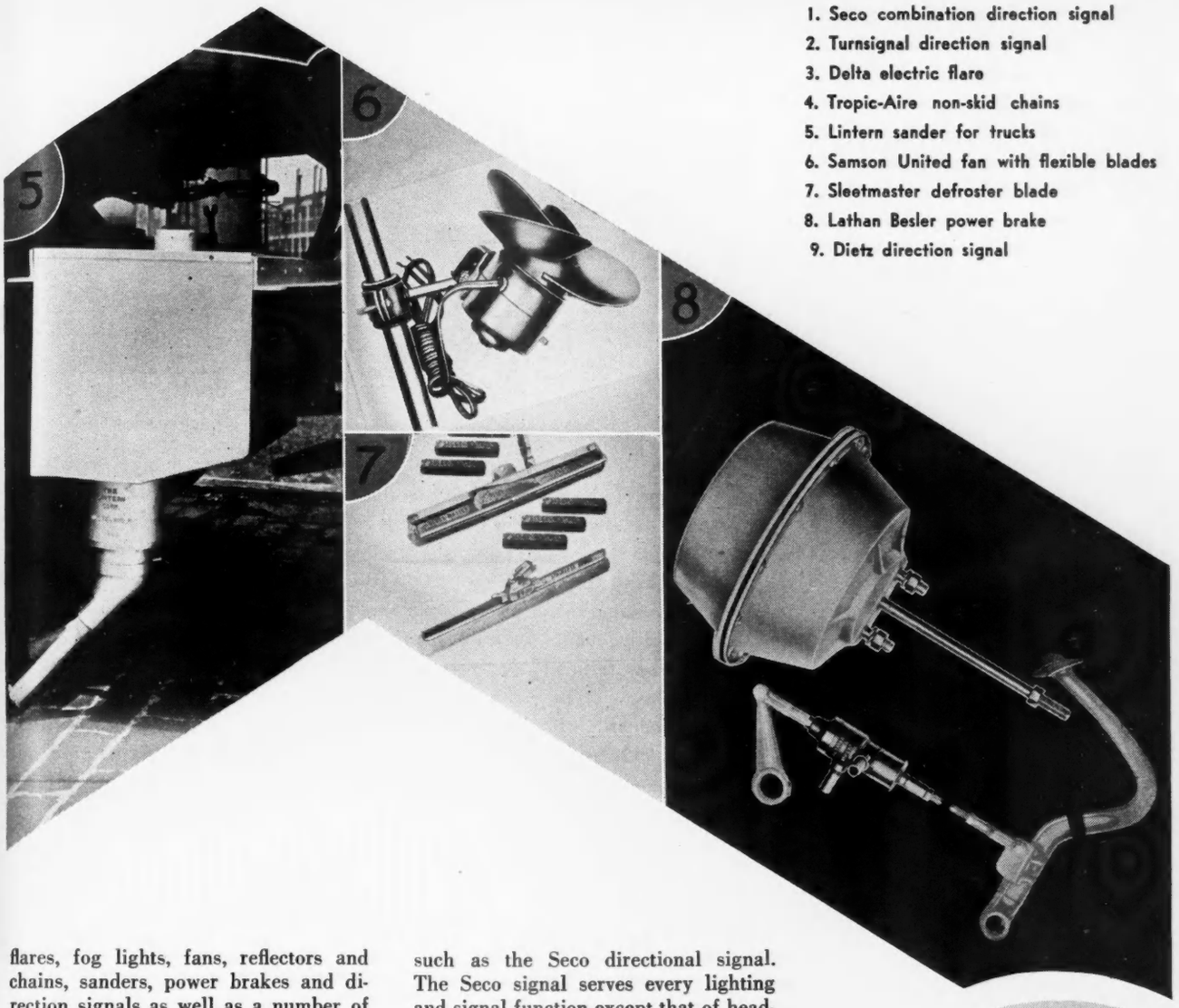
Safety

Accessory Equipment for Motor Trucks Intended to Promote Safe Operation

IN the days when the unprotected truck cab was the style of the age, drivers had to be tough to withstand the rigors of winter driving. That was when the idea of a closed cab was pooh-poohed as something for sissies only. Cabs were cold. There were no windshields to become frosted. But tough drivers did not necessarily make safe drivers, and drivers who were hardy were not necessarily efficient. Maintaining schedules was difficult.

Not until the advent of safety accessory equipment—presaged by the trend of modern motor vehicle design—was the fact brought home that in winter a heater made the cold cab unnecessary and undesirable from the standpoint of efficiency; that in summer the cab need not be a hot hole and an ever-present danger as long as it was practical to design ventilation into the cab; that defrosters were a necessity if fleets were going to maintain schedules in bad weather and drivers were not to run the risk of driving blind; that

1. Seco combination direction signal
2. Turnsignal direction signal
3. Delta electric flare
4. Tropic-Aire non-skid chains
5. Lintern sander for trucks
6. Samson United fan with flexible blades
7. Sleetmaster defroster blade
8. Lathan Besler power brake
9. Dietz direction signal



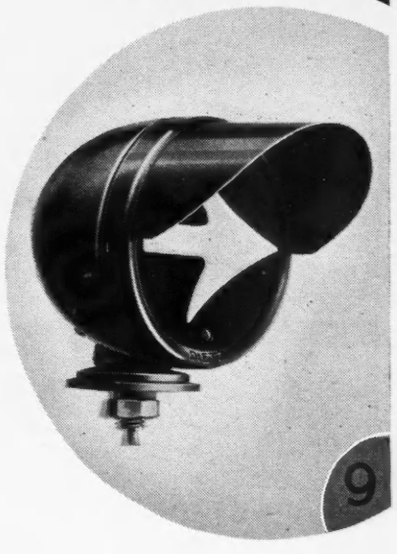
flares, fog lights, fans, reflectors and chains, sanders, power brakes and direction signals as well as a number of other safety accessories have a part to play in efficient operation and in assuring safety on the highways.

UPON direction signals, their proper use, and upon the ability of the driving public to read and understand them rests the job of cutting down turning accidents. For the driver, convenience of operation has been achieved in various ways. Direction signal switches may be operated from the steering wheel or steering post; from the dashboard or gear shift lever; and in one instance the manufacturer has incorporated the switch in the knob of the gear shift lever so that the signal can be operated simultaneously while shifting gears, if necessary. Simplification and efficiency has been the effect of signal switch box improvement. Pilot lights now inform the driver whether or not the signal is working.

Direction signals generally have been so improved that they now function for many purposes such as a number plate lighter and tail lights as well as a direction signal arrow indicator. Some boast the wig-wag stop light feature such as the Seco directional signal. The Seco signal serves every lighting and signal function except that of headlights and marker lights. An interesting feature of the Seco is a caution flare designed to attract attention to the direction signal arrow. It also possesses the reflector type glass with which all signals are now being equipped to comply with certain state laws. Another feature is the control of arrow light intensity. During the night, with the tail light on, a subdued but clear arrow light is visible from 150 to 180 ft. In daytime when the tail light switch is not operating, the arrow light has seven times the intensity of the light at night, so that the arrow may be seen at a distance in the brightest sunlight.

The Teleoptic Tell-A-Turn direction signal is a combination of tail light, stop light and direction signal with the control switch incorporated in the gear shift knob for easy, instantaneous operation. This switch consists of one button which is pushed in the direction the driver may wish to go. A pilot light is included in this switch.

A new model Teleoptic Tell-A-Turn signal designed for those states where combination signals are not permitted



will be on the market early in 1937. Details have not yet been released, but reports indicate visibility will be at least 200 ft. and its design will be different from any direction signal on the market.

Turnsignal's directional signal uses

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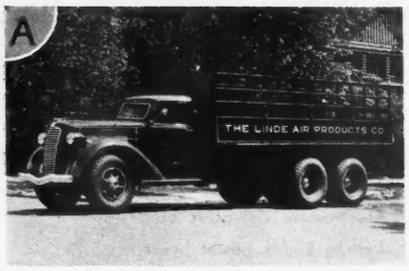
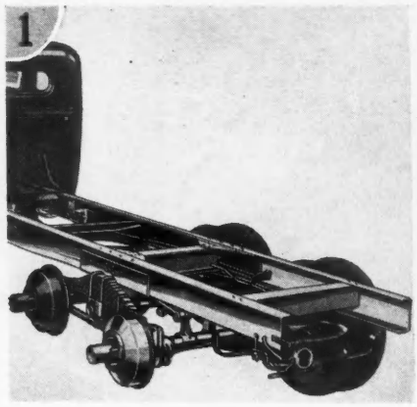
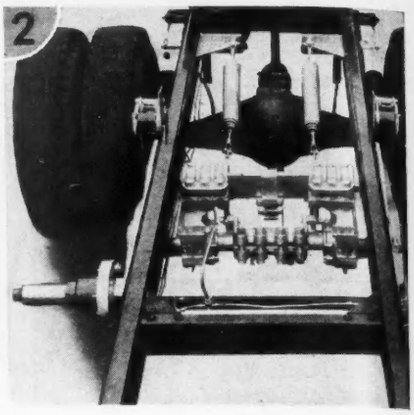


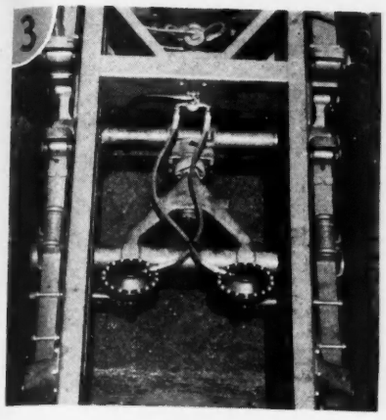


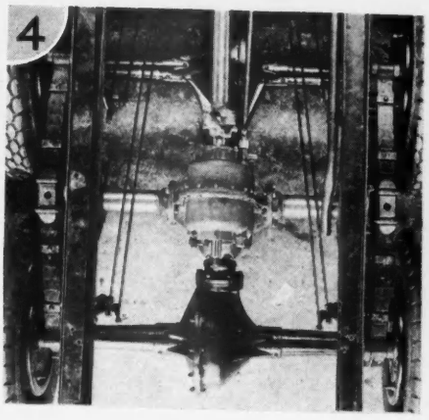


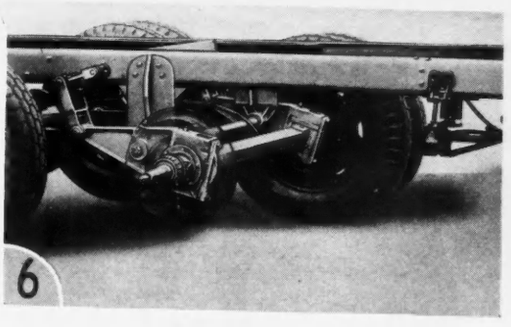
A—Diamond T truck with Truxmore third axle. B—White truck with Tructor third axle. C—Chevrolet with a Grice unit. D—Ford made into a six-wheeler by Warford. 1. Timken third axle unit. 2. Truck Equipment (Truxmore) unit showing gravity spring suspension. 3. Trucktor third axle assembly (chain drive unit also available). 4. View of Thornton unit that gives dual drive. 5. Warford four-wheel-drive unit. 6. Utility's arrangement of the third axle. 7. Cutaway view of Gear Grinding (Grico) transmission assembly of its four-wheel-drive third axle unit. 8. Perfection's third axle arrangement. 9. Continuous Torque (Hi-Lo) third axle. 10. Nelson LeMoon third axle assembly. 11. Little Giant third axle. 12. Arrangement of the Six Wheels unit. 13. Acme unit with frame extension

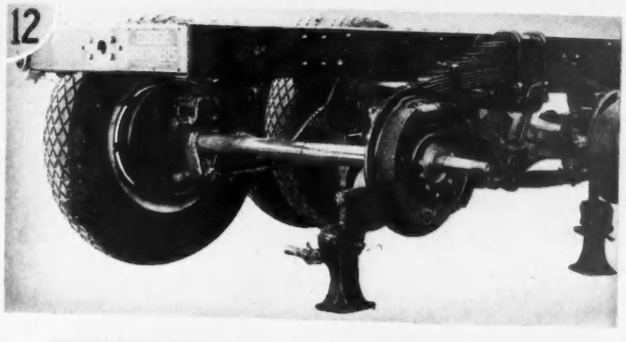
THIRD Axle ALBUM

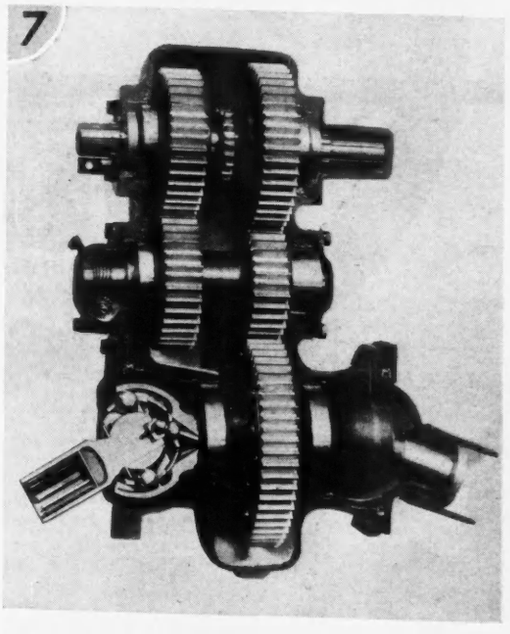
COMMERCIAL CAR JOURNAL
NOVEMBER, 1936

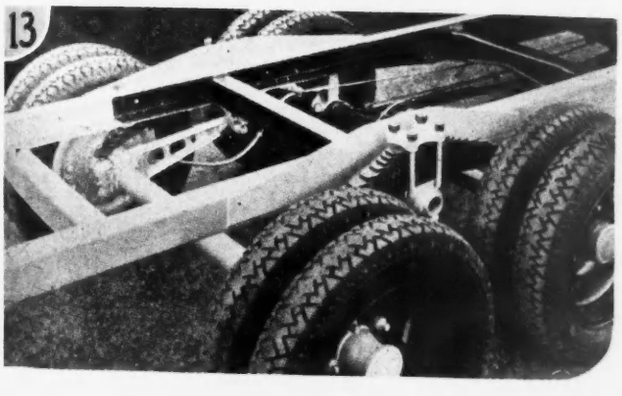


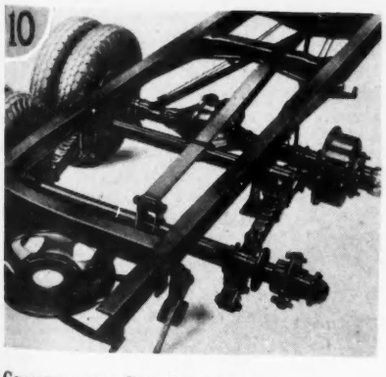


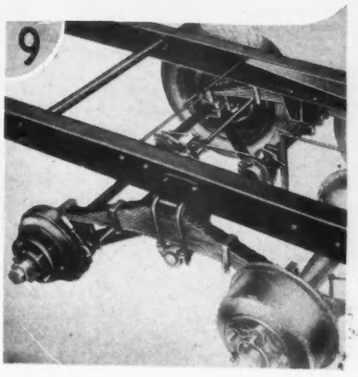


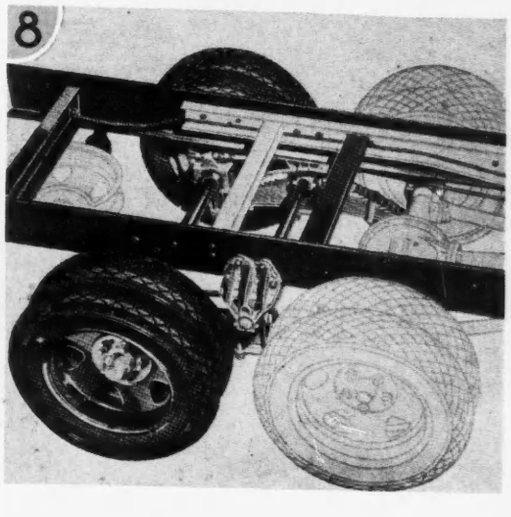








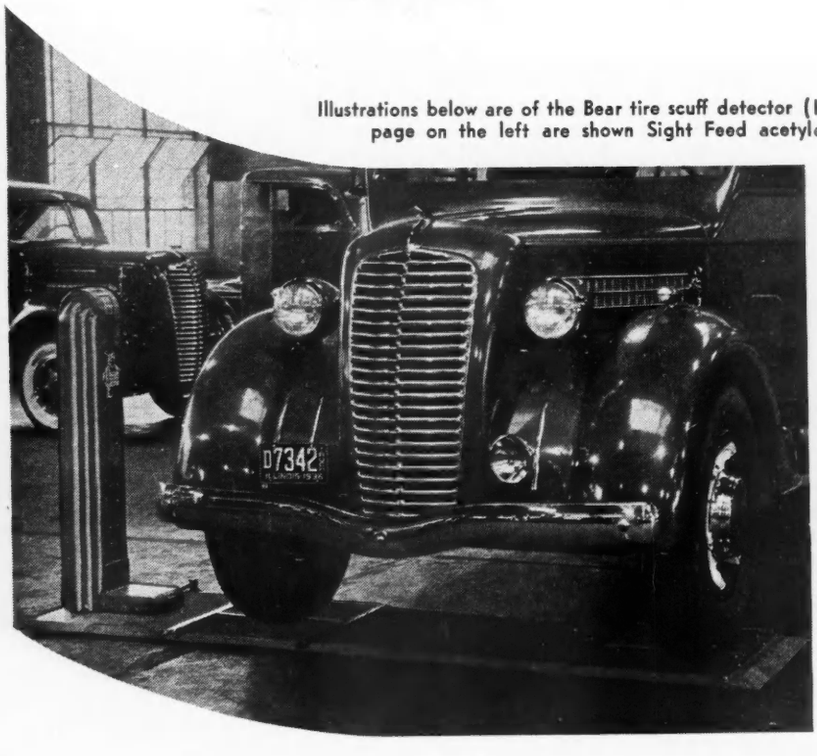


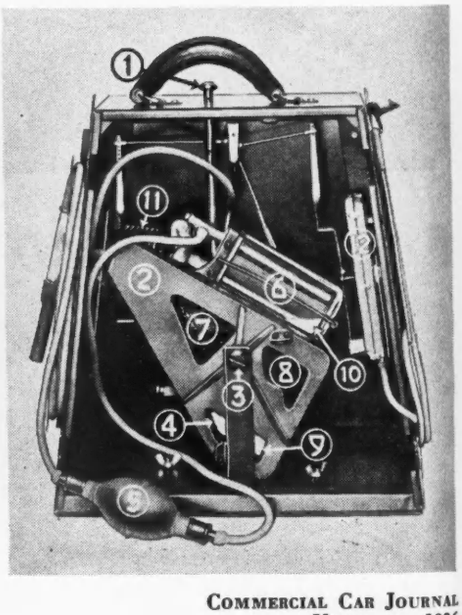


Shop Equipment

REGARDLESS of the mental capacity and willingness of the shop crew their efforts are limited by the amount of equipment which is available for their use. Hence the equipment in a shop is a fair gage of a shop's efficiency. One of the reasons that more equipment is not used in the fleet shops of the country is because the man who controls the purse strings may not be acquainted with the latest developments in equipment designed to maintain his fleet. With this thought in mind recently announced equipment is described in this article. Not in detail but with enough salient facts to enable an interested fleet man to pursue an intelligent course of investigation.

Illustrations below are of the Bear tire scuff detector (left) and Hays analyzer (right). Bottom of opposite page on the left are shown Sight Feed acetylene generators and Cedar Rapid's wrench gage





Tire Scuff Detector

THE Bear tire scuff detector is designed for fast and reliable wheel and steering alignment inspection. All that is required is to drive the vehicle on the runways, both front and rear wheels are tested as they come in contact with sensitive detector blades. It registers the scuff or drag caused by wheel misalignment. An automatic trip device returns the indicator to zero for the next reading. It shows in fractions exact condition of alignment and indicates tire wear in percentages. Bear Mfg. Co., Rock Island, Ill.

Exhaust Gas Analyzer

THE Hays Corp., Michigan City, Ind., offers a new engine testing instrument which indicates motor efficiency by analyzing the exhaust gases. The new instrument requires no electrical connections, and is so simple in operation that no technical knowledge or skill is required of the operator. It is self-contained and has been especially designed to stand rough usage. Except for a simple bearing to tilt the analyzing body to the sampling position and then to the reading position, there is no moving mechanical part in the instrument and no friction except liquid friction.

Acetylene Generator

THE Sight Feed Portable Acetylene Generator made by the Sight Feed Generator Co., Richmond, Ind., will produce a pure hot grade of acetylene gas at any desired pressure from 2 to 15 lb. at a greatly reduced price. The cost of acetylene produced in this generator is the cost of carbide, water and the depreciation on the generator. Every cubic foot that is generated can be used whereas the gas that is delivered in tanks cannot all be used because it is impossible to completely exhaust cylinders with present torches.

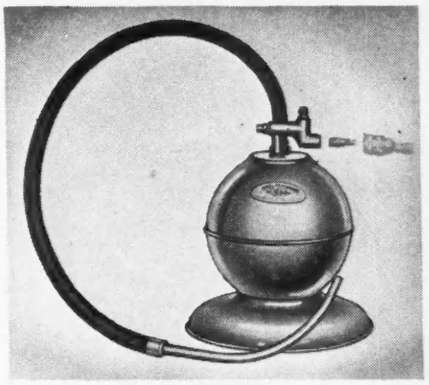
Wrench Gage

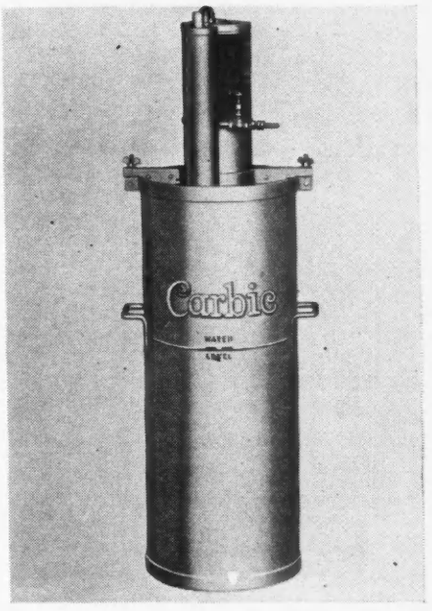
THE Cedar Rapids Engineering Co., Cedar Rapids, Iowa, has provided a socket wrench fitted with a dial gage so that the mechanic can see how much pressure he is using to tighten any nut when the wrench is used. This tool removes the guess work in attempting to uniformly tighten cylinder head nuts and all of the other parts of an automotive vehicle where uniform or known pressure is desirable. Naturally the "sense of feel" is eliminated as protection to distortion and an accurate measurement replaces it.

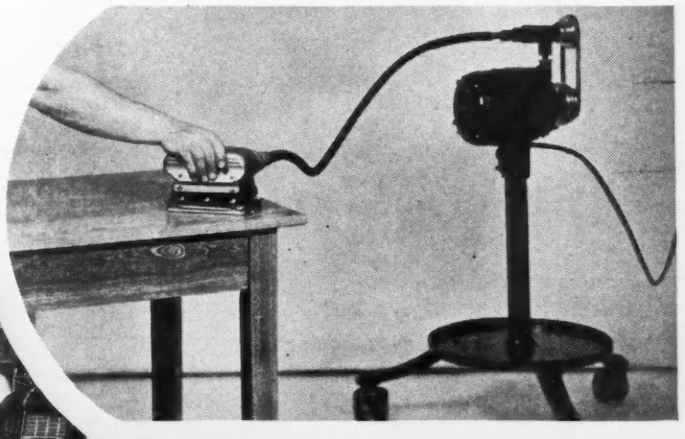
Linde Generator

A NEW Carbic medium-pressure acetylene generator has been announced by Linde Air Products Co., N. Y. C. This is known as the Carbic Type CMP-1. It

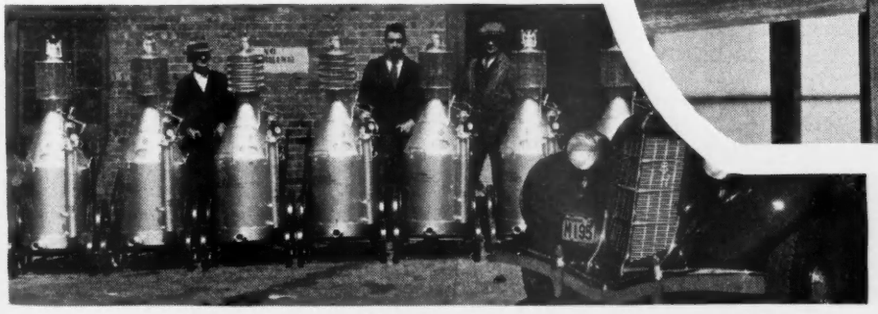
(Turn to Page 156, Please)

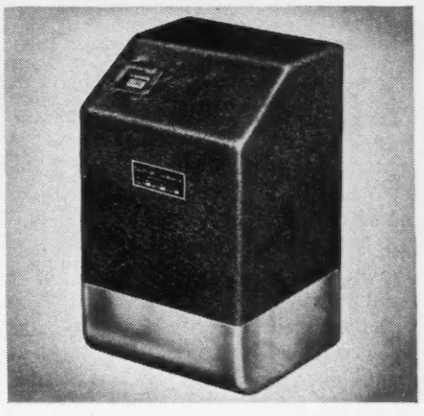


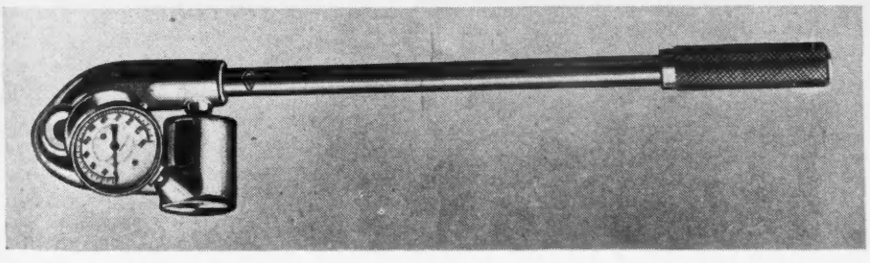




Illustrations on right (top down) are: Aro gear flusher; Linde acetylene generator; Sterling sander; Deady fuel meter



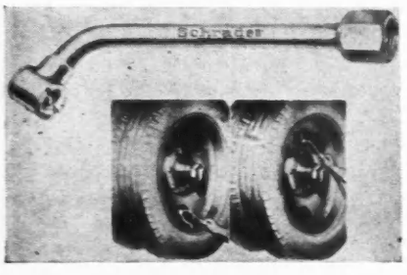




SHOP Supplies

Schrader Air Chuck

A NEWLY designed dual foot air chuck with six-in. extension, has been announced by A. Schrader's Son, 470 Vanderbilt Ave., Brooklyn, N. Y. The combination of the long extension and the dual foot make for easy servicing of inaccessible tire valves particularly dual tires on trucks or busses.

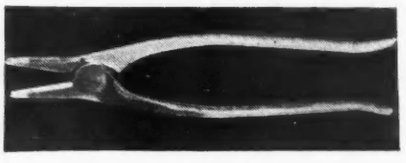


Flashlight Screw Driver

KNOWN as No. 0F5, Bonney Forge & Tool Works, Allentown, Pa., has added a flashlight screw driver to their line. The handle is of transparent, amber-colored, non-conducting composition

material containing two standard flashlight batteries and bulb. Blade is 3/16 in. in diameter with 3/16 in. tip. The tip is machine-ground and magnetized for picking up small objects. Blade is 5 in. long. Length overall is 10½ in.

No. B21 lock ring plier has also been added to the Bonney line. This plier is designed especially to spread the



snap lock ring and horseshoe type of brake key when removing from brakes, transmissions, differentials, pedal, clutch and fan pulley shafts assemblies. It measures 8 in. overall. It is designed to spread any lock ring washer up to 1¼ in. in diameter.

Prep-Sol Cleaner

PREP-SOL has been chosen as the name of the cleaner formerly known as Sol-Kleen, which is for use by refinishers of automotive equipment to clean and prepare old synthetic finishes for repainting. Prep-Sol is a du Pont product.

Brake Wedge Shims

THE L. F. Kreger Mfg. Co., Chicago, Ill., has announced brake wedge shims for taking up wear in the brake shoe spreader rod of Ford brakes. They are

said to be easy to install and to simplify adjustment, and will assist in eliminating chatter. Packed 100 in a single convenient metal container.

Globe Improves Battery

MEDIUM duty batteries designed for fleet service by Globe-Union, Inc., Milwaukee, have been improved with the inclusion of a new type plate separator known as Spintex. This rubberized material is designed to lengthen the life of batteries. This separation is desirable to eliminate damage caused batteries by constant vibration of vehicles operating under heavy schedules.

Weatherhead Brake Fluid

WEATHERHEAD has a new hydraulic brake fluid which can be thoroughly mixed with any other on the market. This means that no matter what fluid is already in the tank Weatherhead heavy duty brake fluid can be poured in. Non-gumming, non-corrosive, non-injurious to rubber. Weatherhead Co., 620-714 Frankfort Ave., Cleveland.

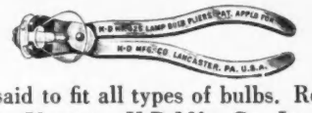
Four-Forty Cable

PACKARD ELECTRIC CORP.'S ignition cable known as Four-Forty is a lacquered high tension cable built to meet the demands of heavy truck operation. It is designed to withstand heat, cold, oil, grease and corona. The cable is protected with a special rubber coat which in turn is protected by Packard's

"Four-Forty" sheath assuring lasting cable service.

Lamp Bulb Pliers

NO. 425 Lamp Bulb Pliers have sharp teeth milled in the jaws to assure a tight grip at the base of the bulb, and



are said to fit all types of bulbs. Retail price: 50 cents. K-D Mfg. Co., Lancaster, Pa.

Foote Gear Catalog

THE Foote Gear Works, Inc., 1300 S. Cicero Ave., Cicero, Ill., makers of the Brad-Foote bus gear has entered the truck field. They have prepared an illustrated manual containing 72 pages of valuable reference and bound for standard files in Kalamazoo style. Write for a free copy.

(Turn to Page 82, Please)

THE Freedom of the Highways

LEGISLATIVE SECTION

THE highways and highway transportation must be kept free of unhealthy influences: those that hinder progress in automotive engineering and those that raise the cost of operation to uneconomic levels. There are a number of unhealthy legislative influences menacing the free flow of highway transportation and economical operation:

The disposition to burden motor vehicles with higher taxes for local purposes (The Trend of Motor Vehicle Legislation, p. 38);

Diversion of highway funds which postpones the building of safer roads (The Billion-Dollar Stick-up, p. 42);

Restrictions on the flow of commerce (Ports of Entry Turn Boundaries Into Barriers, p. 46);

Agitation to force on operators the use of fuel not economically justified (The Power Acohol Jag, p. 50);

High gas taxes that encourage evasion and costly substitutes (Stop the Gasoline Bootlegger, p. 54).

All indicating that we should have a Legislative Armistice (p. 58) while the U. S. Bureau of Public Roads completes a nation-wide survey on which it will be possible to base sane and equitable highway legislation.

THE Trend of MOTOR VEHICLE LEGISLATION

Gird your loins for battle because Legislatures of 43 states scheduled to hold regular sessions in 1937 are expected to:

1. **Work overtime devising new ways of saddling trucks with burdensome taxes;**
2. **Extend the reach of carrier regulation, one way being through Ports of Entry;**
3. **Attempt to rob highway funds in order to avoid increasing local tax levies, and**
4. **Maybe give some thought to realizing the need for uniformity of safety legislation.**

By ROY F. BRITTON, General Manager, National Highway Users Conference

USE of motor vehicles outranks all other human activities in providing legislators with ideas for new laws. That statement is attested to by the fact that approximately 9000 bills pertaining to automotive operations and highways were introduced in state legislatures last year.

Furthermore, with legislatures of 43 states scheduled to hold regular sessions next year, every sign and portent points to continuance of this large-scale incubation of measures relating to ownership and use of motor vehicles.

Activities of law-makers in the various states last year revealed certain well-defined trends of interest to all who depend upon or seek to protect vehicular use of streets and highways. From trends which already have evidenced themselves and from current developments, it is possible to draw rather definite conclusions concerning the course which motor-vehicle legislation will follow in the near future.

One thing is certain: much of the legislation proposed next year will be linked with efforts to increase safety on streets and highways. Legislators, knowing that nobody is opposed to promotion of safety, will feel they are following a popular path across solid ground when they move toward accident-prevention objectives.

DURING comparatively recent times, the marked advantages of uniformity in legal requirements aimed at safety have become increasingly apparent. Clear reasoning, as it replaces impetuous but well-intentioned thoughts, reveals that haphazard enactment of laws relating to automotive equipment really handicaps safety efforts instead of aiding them.

It well may be expected, therefore, that the coming year will witness progress toward achievement of uniformity in state laws relating to auto-

motive equipment. This trend toward uniformity, however, may be expected to produce the least effect upon existing size and weight requirements. These requirements offer a fine field of activity for those who seek to handicap highway transportation, and efforts to apply uniformity to them always will meet opposition.

IN point of number and from the standpoint of attention which will be devoted to them, legislative proposals dealing with the levying of special taxes and fees upon highway users will hold their front rank position.

Looming over the horizon is the possibility that taxation increases will be produced to meet three sets of demands, each calling for increased use of funds collected for highway purposes.

More funds—and consequently increased taxes—will be demanded to meet requirements for expansion of road mileages under control of the various states. More money will be demanded for use on secondary roads, and also for purely land service roads which do not really come under the farm-to-market classification. Cities will be making increased demands upon state highway funds for money to be used promiscuously on city streets. These demands will go beyond the logical calls for state money to be used on arterial routes through cities. They will come from city officials who will seek to obtain funds from state treasuries for application to local-traffic streets which are remote from the interests or needs of state populations.

Taxation increases, it will be seen, generally will arise from the increasing desire to draw upon state funds for more or less local purposes, with the local tax burdens thus being lightened at the expense of state populations.

THIS general desire to avoid increased local tax levies also stands as a prime cause of diversion of money from highway funds to non-highway purposes. Where diversion is practiced, the net effects of increased automotive taxes are produced. In fact, diversion too often serves officials as

the means of circumventing tax increases: that, perhaps, accounts in part at least for the fact that more than 200 bills providing for the diversion of motor vehicle and motor fuel imposts to non-highway uses were introduced in the legislatures of 40 states during the year 1935. The purposes for which money shifted from highway funds under such legislation has been used varies greatly, offering clear indications of purposes to which diverted money will be applied during the coming year. Schools, unemployment relief, social service, and many other general expenditures, cost of which should not be saddled upon any single group of taxpayers, are included in the list of general governmental activities to which money from highway funds has been and will be diverted.

The campaign against diversion is of prime importance. Whenever victories are won in that campaign, forces are set in operation against unjustified taxation of motorists, provision and maintenance of necessary highway facilities are encouraged and opportunities to "build safety" into roads are increased. The recent and overwhelming adoption by Maine's voters of a referendum law outlawing diversion should be an inspiration to those who will be carrying the anti-diversion attack during the next year's extensive legislating.

THEN AND NOW

THE Trend of MOTOR VEHICLE LEGISLATION

SUBSTANTIALLY, the campaigners against diversion will place increasing stress upon declarations along the lines of those which have been developed in this connection by the National Highway Users Conference, as follows:

"The distance that a citizen must travel by automobile in his daily occupation is an absurd measure of the amount of taxes he should pay for any purpose other than construction and maintenance of the highways he uses.

"That unfair yardstick is used when proceeds of gasoline taxes, levied on a special class of citizens for a special purpose, are diverted to any other purposes.

"If gas taxes are diverted to unemployment relief, for example, the farmer living 10 miles from town pays 10 times as much toward unemployment relief as the farmer who lives only one mile from market. This unfairness applies with equal force to the salesman or any other business man who uses a motor vehicle in his occupation."

While actual trends do not always coincide with those which are desirable, all who are concerned with the welfare of highway transportation should strive to make them coincide so far as future highway construction is concerned.

State highway planning surveys now are being conducted in most of the states, with the cooperation of the Bureau of Public Roads, U. S. Department of Agriculture. Legislation relating to highways should be held in restraint, as far as possible, until these surveys are completed, so that the greatest possible amount of public transportation benefits will accrue from expenditure of each "highway dollar."

Data gathered by the state planning surveys should be studied by all interested groups, with state conferences of highway-users groups providing the media for advancing formulation of long-range programs in each state.

With the word "regulation" asserting its presence these days almost every time the word "transportation" is spoken or written, small wonder attaches to the declaration that state legislatures will produce a wide range of proposals relating to transportation regulation during their next sessions. Many of these, of course, will merely be introduced; others will receive more serious consideration.

There is at hand the danger of producing over-regulation in the interests of and for the benefit of for-hire carriers. Such over-regulation most certainly tends to suppress the use of commercial vehicles for private purposes. As a matter of fact, it is beginning to be generally apparent that private transportation operations are coming more and more under the shadow cast by regulation.

THE extent to which regulation can give support to one type of transportation while handicapping another is beginning to be revealed in connection with application of the provisions of the Federal Motor Carrier Act. In a constantly increasing number of minds is arising the question recently set forth in black-on-white by a newspaper columnist.

"Should the development of bus and truck transportation be brought under the dominion of an agency (the Railroads) which may be interested in retarding that development?"

The fact of the matter is that the railroads have been scrambling far and wide to acquire bus and truck lines since the Motor Carrier Act went into effect, using holding companies as a medium to achieve their ends.

Continued to their logical conclusions, these activities under the reign of regulation would lead to restriction and railroad control of for-hire bus and truck operations, with the application of heaviest possible handicaps to private use of motor vehicles following as a natural aim of established monopoly in the field of for-hire operation.

THE existing trend of legislative and judicial activities to extend the reach of regulation over ever-increasing stretches of property transportation is clearly indicated by two court cases, one in Texas and the other in Colorado, which have been decided by the Supreme Courts of those states. Each of these cases deals with the extension of carrier regulatory laws as they concern persons who transport their own property in their own vehicles.

The Texas Supreme Court, in the case before it (New Way Lumber Co. et al. v. L. A. Smith et al.), held that a lumber company using trucks in the delivery of its own lumber to its customers is subject to the permit requirements of the Texas Truck Regulatory

Act when it makes a charge for such transportation.

IN the Colorado case (Public Utility Commission of Colorado et al. v. Manley et al.), the Supreme Court of that state similarly held that a coal mine operator who uses his own truck to deliver his own coal to customers is subject to the state's private carrier regulatory law.

The proposition that "the use of the highways for gain is an extraordinary use which the state may prohibit or regulate" is quoted by the Supreme Court of the State of Washington in its decision in the case of Prater et al. v. Department of Public Service et al. The Court sustains the administrative body in its finding "that the minimum rates for contract carriers and the just, fair, reasonable and sufficient rates for common carriers should be the same when the service rendered the shipper is substantially the same." In upholding this finding the Court adopts the language of the U. S. Supreme Court in Stephenson v. Binford, 287 U. S. 251. One quotation from the Stephenson case is particularly significant and may later be found to contain many elements of the prophetic. It follows, in part:

"This provision, by precluding the contract carrier from rendering service at rates under those charged by the railroad carriers, has a definite tendency to relieve the highways by diverting traffic from them to the railroads."

Beyond these legislative and judicial trends toward extension of regulation of property-transportation rests still another trend which points similarly toward establishment of monopoly through the burdening of highway transportation to the point of extinction of present enterprises. There can be no doubt, when effects of proposals already placed on statute books of some states are viewed closely, that some interests are striving vigorously to make taxes on trucks and buses prohibitive. Trucks and buses, of course, should pay their share of taxes, taking into consideration their part of the responsibility of supporting construction and maintenance of highways; but their taxes should be based upon a compensatory rather than a punitive theory.

HIGHWAYS now, as they always have, provide the means for use of vehicles which carry people and things in a "personalized" way—as contrasted with the mass methods of transportation that take one person or one shipment when and where many other persons and many other shipments are being moved. Centered in the use of vehicles of limited capacity and based upon fulfillment of individual transportation needs without delay, highway transportation affords a specialized and personalized service which cannot be duplicated by any transportation medium that depends upon accumulation of people and shipments in large numbers for its success.

When those facts are held closely in mind, it becomes apparent that any effort to break down the presence and efficiency of such a "personalized service" is definitely reprehensible and is certainly in conflict with the public interest.

Obviously, rendition of that service through the physical media of highways and automotive vehicles depends upon freedom to come and go as necessity or desire may demand, without undue delay. Those who seek to handicap highway transportation, realizing that fact full well, are working diligently to curb freedom of highway traffic movement. To accomplish their ends, in part, they are promoting establishment of traffic barriers at points where highways cross state lines, mainly utilizing the "port of entry system" for this purpose. Under the guise of tax-collection and law enforcement, they already have succeeded in setting up traffic-impeding stations along the boundaries of several states.

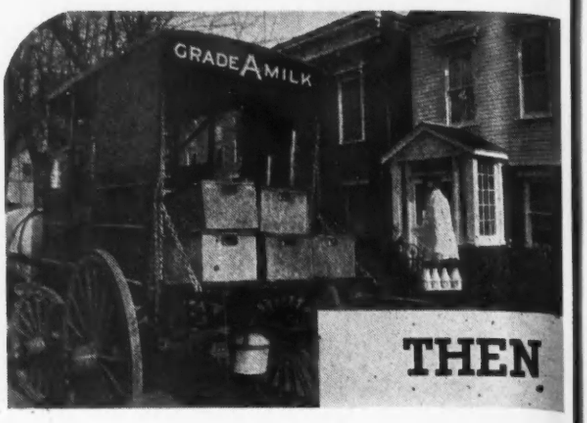
There can be no doubt but that the adoption of the port of entry plan verges closely upon the European situation where customs barriers and bristling frontiers breed suspicion and where contact with neighboring peoples is curtailed and suppressed.

RESTRICTION of highway transportation through the media of regulation and taxation generally is encompassing the fields of contract-carrier and common-carrier operations, with similar control of private operations planned for the future. The port of entry operations, however, strikes directly at private-vehicle operations, while concurrently handicapping commercial operations. Vacationing motorists whose routes this year carried them across the borders of western states, particularly Arizona, California, New Mexico, Idaho and Oregon, are reciting experiences which reveal the extent to which state boundaries are being "Europeanized." Beyond being recitals of inconveniences and delays, these statements of experience hold significance because they show the surprising advance already made by this planned procedure of discouraging ownership and use of privately owned and privately operated motor vehicles.

If these late days of 1936 were less marked by economic readjustments and political developments which place large demand upon the public mind, the current efforts to hamper and to impede highway transportation would be broadly and generally viewed with apprehension and misgivings. As matters stand, however, the great mass of persons whose valued and productive use of highways is threatened are unaware of the extent to which their rights already have been placed in jeopardy.

In the face of that condition, all who have knowledge of the existing situation should apply themselves in coordinated efforts to spread that knowledge and to thwart plans which seek to establish unjustified restriction and undue regulation of automotive transportation.

The BILLION DOLLAR Stick-Up!



THEN

This Colossal Sum Diverted From Highway Funds Delays by That Much the Needed Program of Building Safety Into the Highways

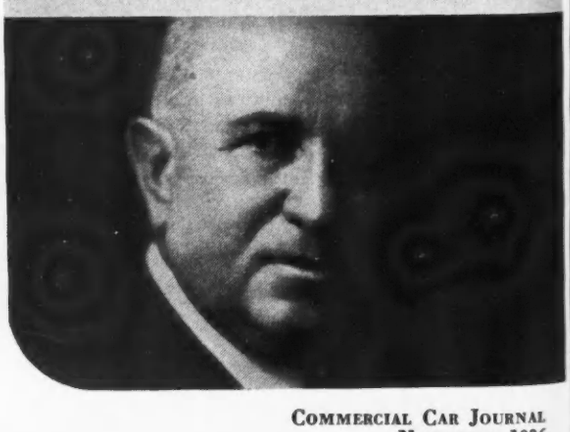
THE practice of diverting special motor vehicle tax revenue to purposes totally unrelated to highway construction, improvement or maintenance is continuing to spread. To date, the total of the road money thus misapplied since 1924 has passed well beyond the $1,000,000,000 mark.

Diversion is particularly indefensible at the present time when the entire nation is aroused over the traffic accident problem. Every dollar diverted from road construction and improvement delays by just that measure the much-needed program of building safety into our highways. It is generally recognized that roads today are far behind the development of the vehicle that uses them and diversion is postponing to a tragic degree the possibility of bringing the road plant up to today's standard.

Meanwhile, lives are being lost daily because of narrow winding roads, inadequate sight distances, and other hazards inherent in the road itself and which could be eliminated much more rapidly if the entire revenue from motor taxes were spent on improvement.

The total amount of money diverted during the past twelve years

By THOMAS P. HENRY, President, American Automobile Association



AND NOW

was sufficient to have built no less than ten transcontinental, coast-to-coast highways. There can be no question that if this money had been properly applied to highway improvement, the nation's road plant today would be at a much higher standard of safety. In all too many instances lives lost because of unsafe conditions leading to accidents can be regarded as sacrifices to that modern Moloch, diversion.

The position of motor transport in regard to the use of special motor taxes is simple and eminently sound; namely, that these are special taxes, levied for a special purpose and can be justified only so long as they are applied to that purpose and that purpose alone. When they are used for purposes unrelated to the highway, their justification disappears and they become an inequitable burden upon car owners.

The growth of the diversion practice is one of the most reprehensible chapters in the history of American taxation. It has been based upon expediency alone and no serious attempt ever has been made by anyone in authority to defend the practice from the standpoint of equity or justice.

IN 1924, seven states were diverting motor vehicle taxes, the total thus misapplied during the year being $10,728,830. In 1934, 37 states were guilty of this practice and the total annual diversion had grown to $184,563,339, a gain of 1620 per cent. Last year there was an estimated diversion of about $200,000,000 with the same or more indicated for the present year. Although gaining steadily each year, diversion did not really make any great advance until 1931 and 1932 when legislators, faced with dwindling revenue and increasing needs for expenditure, turned to the motor vehicle fund as a source of money. In those two years, 21 new states joined the diversion column and the amount of road money misappropriated nearly quadrupled in volume.

As can be seen from the Table 2, New York far and away leads all other states in the amount of road money diverted, accounting for nearly a third of the total. This table, showing diversion for the year 1934, the latest for which accurate data is available, refers to actual diversion alone. In addition to this there was a total of $20,832,125 of "possible diversions"; that is, expenditures concerning which there might be some doubt as to proper classification.

Review of the entire period from 1924 through 1934 reveals that only five states—Kentucky, Missouri, Nevada, Vermont and Wyoming—have records absolutely clean of actual or possible diversions.

In considering statistics on diversion, it should be remembered that the totals given cover only official state diversions

The BILLION DOLLAR Stick-Up!

THEN AND NOW

TABLE I
The Growth of Diversion

Years	Diversions	"Possible Diversions"	Total Diversions and "Possible Diversions"
1924	$ 10,728,830	.....	$ 10,728,830
1925	7,451,537	$ 3,997,900	11,449,437
1926	6,247,717	6,316,021	12,563,738
1927	8,333,317	4,202,116	12,535,433
1928	11,981,560	10,573,147	22,554,707
1929	14,024,157	17,242,677	31,266,834
1930	19,485,534	14,520,937	34,006,471
1931	24,275,310	25,475,130	49,750,440
1932	82,832,171	19,615,147	102,447,318
1933	145,253,966	24,124,185	169,378,151
1934	163,731,214	20,832,125	184,563,339
TOTAL	$494,345,313	$146,899,385	$641,244,698

* Prepared by National Highway Users Conference. 1924 figures apply to gasoline tax diversion only.

TABLE II
Tax Diversions by States

State	Amount	State	Amount
Alabama	$ ——	Nevada	——
Arizona	302,000	N. Hampshire	——
Arkansas	250,000	New Jersey	8,966,000
California	22,000	New Mexico	297,000
Colorado	2,795,000	New York	60,369,772
Connecticut	104,000	N. Carolina	1,000,000
Delaware	——	N. Dakota	1,100,000
Florida	6,318,000	Ohio	19,103,000
Georgia	2,386,000	Oklahoma	3,181,000
Idaho	——	Oregon	——
Illinois	15,512,000	Pennsylvania	——
Indiana	3,937,000	Rhode Island	698,000
Iowa	——	S. Carolina	6,000
Kansas	108,000	S. Dakota	1,907,000
Kentucky	——	Tennessee	2,029,000
Louisiana	1,782,000	Texas	7,935,000
Maine	——	Utah	38,000
Maryland	4,123,000	Vermont	——
Massachusetts	11,034,000	Virginia	58,000
Michigan	785,000	Washington	853,200
Minnesota	54,242	W. Virginia	——
Mississippi	265,000	Wisconsin	6,073,000
Missouri	——	Wyoming	——
Montana	22,000		
Nebraska	318,000	Total	$163,731,214

Prepared by National Highway Users Conference. Figures do not include possible diversions.

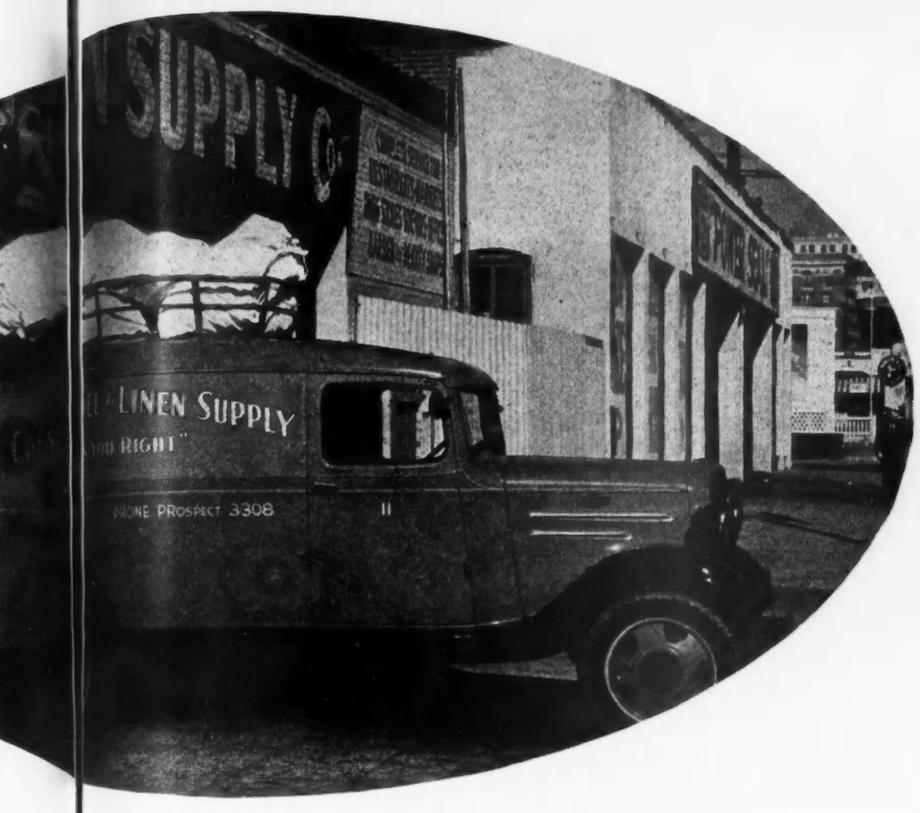
and do not include diversions of funds allocated to local units by the state government or diversion of taxes imposed by the local units themselves. Another form of diversion frequently overlooked is the "borrowing" of money from the highway fund, which borrowed money is rarely returned.

MANY and varied are the purposes for which diverted funds have been used: the use of motor vehicle funds to aid oyster propagation is an outstanding example. The general fund, schools and relief, however, have been principal beneficiaries of the diverted highway money. During the 10-year period ending with 1934, a total of $186,453,076 was absorbed by state general funds, $115,630,807 went to schools and $76,734,154 went to unemployment relief.

The plundering of highway funds has aroused a tremendous amount of antagonism and many organizations have entered the lists in an attempt to end it once and for all. The American Automobile Association and its affiliated clubs have carried on intensive battles on many fronts and in many instances they have successfully protected the rights of the car owners; the National Highway Users Conference has the ending of diversion as one of its principal objectives; the American Association of State Highway Officials, the American Farm Bureau Federation, the American Petroleum Industries Committee, the American Road Builders Association, The Automobile Manufacturers Association, the United States Chamber of Commerce, the National Grange, and many other organizations representing those interested in highway development are actively opposed to misuse of road money. Even the Federal Government—although its automotive excise taxes are diversion pure and simple—has expressed opposition to diversion of state taxes and in the current Federal-aid act has adopted a provision intended to deter this practice.

THERE are many grounds on which this opposition is based. Motor vehicle owners have paid gasoline taxes and registration fees with good grace because these taxes were originally imposed to help pay for highway development. The diversion of these funds to non-highway purposes is the abandonment of the benefit theory and a breach of faith with the motor vehicle owners.

Diversion subjects motorists to double taxation and imposes on them as a class a disproportionate share of the costs of government. It encourages higher motor taxes—taxes that are out of ratio to properly ascertained road costs and motorists' obligation for these costs. It endangers the road bonded indebtedness of the states now dependent on motor taxes to the extent of more than $1,000,000,000. It places in jeopardy the large investment in our highways, since the tendency in states where diversion is rampant has been to neglect or defer maintenance and re-



pair. Diversions of motor taxes to other government needs, however deserving though those needs in themselves may be, tends to delay the overhauling of tax structures in the interests of stability, dependability and equity:

WHAT can be done to stop diversion? The answer to this is two-fold: first, it is necessary to impress on legislators time and again the unbending antagonism of highway users to misuse of their tax monies; second, experience has proved that the threat of diversion can be ended for all time only through amendment of the state constitution to make future raids on the highway fund impossible.

Already several states have taken this action and have bulwarks against diversion built into their basic law. These states are Missouri, Minnesota, Kansas, Colorado and Maine. Maine is the last state to adopt such an amendment, its voters having passed on the question at the polls on September 14, last. Colorado adopted its amendment in 1935, following a diversion of nearly $3,000,000 in 1934 for pensions. In several other states there are constitutional inhibitions against using any tax or bond issue for any purpose except that specified.

The development of the automobile was so rapid and the need for increased road expenditures mounted so quickly that it is small wonder that motor taxes have not been built on the most scientific basis. It was a tremendous problem that faced the states in their road-building requirements and on the whole they met it well. Today, however, there is opportunity for a breathing-spell in which to review the situation, note the mistakes of the past and to proceed along an orderly, business-like course.

INSOFAR as motor taxation is concerned, the future course is well signposted and will be increasingly so in the months ahead. In the first place, the formula for deciding exactly what share of street and highway costs should be borne by motor transport has been reached and decided upon. This formula is contained in the agreement of the Joint Committee of Railroads and Highway Users and provides that motorists shall pay (a) the entire cost of state highways, (b) a portion of the cost of local roads, based on the amount of general use and (c) a part of the cost of *arterial routes* through cities.

Failure to apply this formula universally has been due in part to lack of adequate information. However, at the present time surveys are going forward in many states that will provide the needed data.

These surveys, being carried on in cooperation with, and under the supervision of, the United States Bureau of Public Roads will determine the exact costs of the roads of the state, determine traffic needs for future development, ascertain how much traffic is local and how much general on the various routes, and report the amount of contribution made toward road expenses by urban and rural residents.

As these surveys are completed it will be a matter of simple arithmetic to find out whether car owners are paying too much or too little for the highways they use. And on these findings, the motor transport of America should place full reliance for the future, and let the chips fall where they may.

If it should be determined that in any instance, the motorist is paying too little, then revision of the law to correct that error should be made. If, on the other hand, it should be found that he is paying too much, then there should be an insistent demand that his charges be corrected in line with the actual needs.

IN my opinion, the second contingency is the much more likely one. In nearly every instance where state budgets of motor taxes and road costs are obviously out of balance, it is the motorist who is failing to receive the proper share. In any event, there can be no question that the nation's tax structure is a grievously imperfect one as long as $200,000,000 are extorted annually in the form of motor vehicle taxes with no beneficial return.

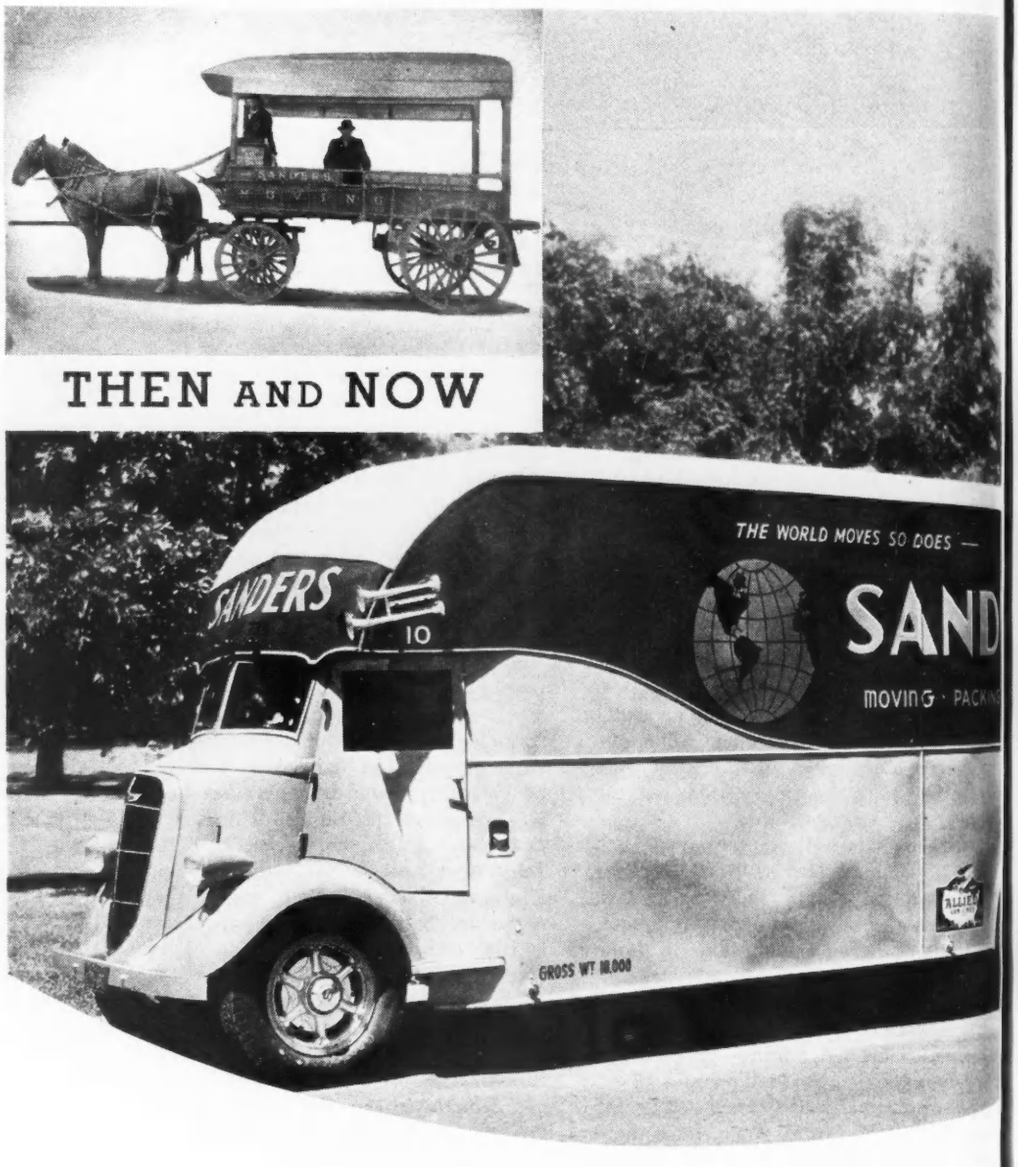
This evil can be stopped; it can be stopped almost overnight if the millions upon millions of persons who have a stake in highway development realize the unjustness to which they are being subjected and determine to end it.

Forty million people ride in passenger cars; thousands of communities are dependent upon the highways for their existence; motor transport provides direct and semi-direct employment for six million persons; and many businesses utilize the highways for transportation of their goods.

In a word, the highway is politically the greatest common denominator in the nation today. The possibilities of this are as yet far from fully realized. Too many who use the highways are apathetic or have failed to comprehend the problems with which they are confronted.

That situation is gradually being corrected. Motor transport has been likened to a sleeping giant. Now, I believe, that giant is beginning to stir and be troubled in his slumber; in the days ahead we may see him rise in the full majesty of his strength and fling his might against those who robbed him while he slept.

PORTS of ENTRY



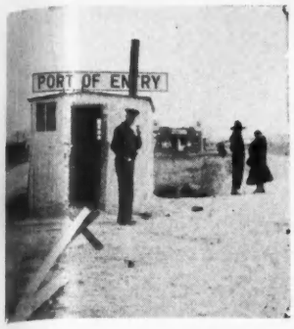
THEN AND NOW

TO European travelers the word "frontier" conjures unhappy recollections of tedious delays, ransacked luggage, confiscated cigarettes, required visas, soul-wearying technicalities and endless lines of officious functionaries. To many Americans the word brings up thoughts of blockhouses, Indian raids and westward-moving wagon trains.

However, the word is rapidly gaining another meaning to Americans. In its new dress it means barricaded roads and highways guarded by state police. It means lines of travelers in motor vehicles waiting to prove their fitness to enter the state, the levying of imposts, etc. Such is the picture that is being witnessed along the invisible boundary lines of some of our states. It is a condition that has actually been allowed to develop right here in the United States of America. It is the outgrowth of the "Ports of Entry" scheme.

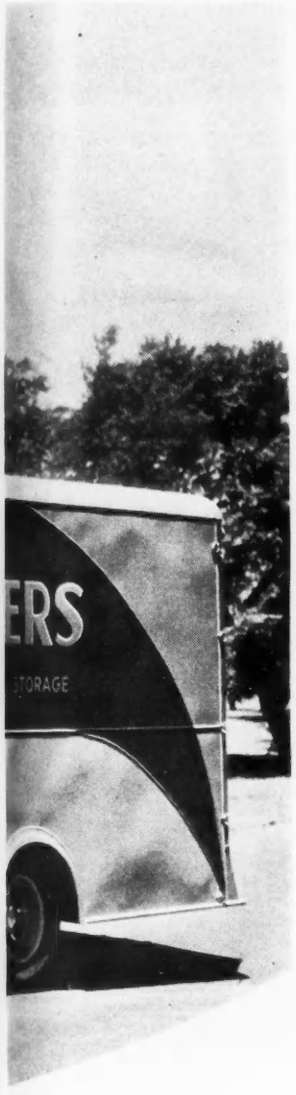
MANY bills providing for ports of entry contain, in the declaration of policy, language proclaiming that the purpose of such legislation is to render the highways safer for the use of the general public; to reduce the wear of the highways, and to minimize congestion on highways. In many instances, however, the bills do not in themselves provide any essential safety measures not already otherwise in effect. Certainly any of these safeguards could be more easily and effectively provided through other and more simple means. Such provisions are not fundamentally regulatory, but are suggestions for police regulation, properly within the province of highway patrols and State police systems.

In practical application, a careful investigation has disclosed that the safety features of the port of entry in-



Turn Boundaries into Barriers

Railroads Seem to Be Greatest Force Back of the Idea Which Must Be Opposed in Principle Because It Obstructs the Free Flow of Highway Commerce



By DAWES BRISBINE
Research Counsel, National Highway Users Conference

spections are played down to such an extent that, in the vast majority of cases, the inspection is either very superficial or is disregarded altogether.

During hours of observation at a dozen or more ports it was particularly noted that there was not one single instance where the brakes of clearing vehicles were even superficially checked. In response to questions, the port officials invariably answered, "Oh, we can tell pretty well if a fellow's brakes are working when he drives up and stops."

Nothing in these laws nor in the proposed legislation can possibly reduce the wear or the congestion of the highways except indirectly through the elimination of vehicles. If that is the aim, a simple law, prohibiting the use of the highways, would quickly and cheaply accomplish that end. If the true purpose of ports of entry be to restrict and prohibit the use of our highways by commercial vehicles, would it not be more honest, more effective, and more economical to enact legislation wherein such purpose is frankly stated?

Other language in these declarations of policy frequently espouses the desire to eliminate rate discrimination. Most State commissions are vested with that power at the present time and with the passage of the Federal Motor Carrier Act of 1935, the Interstate Commerce Commission is clothed with absolute authority over interstate rates and practices. Here again was found not one single instance of a port official making inquiry into the rates or the character of the cargo of a clearing vehicle.

THE original inception of the port of entry theory in Kansas was innocent enough. Kansas is a petroleum-producing State and to protect its producers and consumers alike against the importation of inferior quality gasoline by truck, and for the further purposes of

controlling and collecting the taxes from an ever-increasing volume of bootleg gasoline from other production fields, the idea of policing the borders was conceived. The results apparently were highly satisfactory, not only to the tax collection agencies but to the responsible oil producers of the State. From this experiment, the port of entry system was enlarged to include all commercial vehicles regardless of the commodities carried.

In the report of the Kansas Port of Entry Board, the collections for the year 1935 totaled $189,186.70. A much larger sum, of course, was collected directly by the State Corporation Commission. This latter sum has undoubtedly been indirectly increased somewhat by the mere existence of the ports of entry. The total expense for the operation and administration of the ports for the entire year of 1935 was $233,947.17, or approximately $45,000 more than the actual port collections.

It must also be remembered that one of the reasons for the increased collections by the State since the system was established is the vast and substantial increase in truck traffic. The increase in gasoline tax collections has also been effected beyond doubt by the notable increase in consumption.

LET us give the Oklahoma port of entry system credit for its frankness of administration. It is fundamentally a tax collection agency. All trucks are stopped unless they carry an Oklahoma license. Cargoes containing cigarettes, beer, or motor fuel must be declared, but the tax thereon is paid at the State Capital.

"All trucks and buses entering Oklahoma must register at the Port of Entry, under Penalty of $100 fine." So reads the large sign in front of each of the 57 ports of the State.

Traveling men in small trucks are also stopped and, like the others, must take out an Oklahoma license. It was stated at one of these ports that occasionally a sample of gasoline is taken, but ordinarily there is no actual measurement of contents, no check on weights, and no check on lights, brakes, or other equipment.

NEBRASKA, while not an oil-producing State, had a higher gasoline tax and was, therefore, confronted with an ever-increasing flow of gasoline from other States upon which the Nebraska tax had not been paid.

Taking a leaf from Kansas' book, it adopted a port of entry system of its own as a means of collecting its gasoline taxes. For the 14-month period ended July 1, 1936, the records show that the expenses of the Nebraska system totaled $53,915.00, and that its collections totaled $36,425.38, including both inspection fees and gas tax collections. In justifying this loss of $17,490, officials point out that the ports perform duties for which there is no pay and, furthermore, that they are indirectly responsible for a considerable portion of the collections by the State departments for motor carrier licenses, towed cars, fines, et cetera. It is also claimed that the gasoline tax collections for the year past have shown a material increase.

As for the latter claim, it is interesting to note that in the first five-month period of the present year, compared with the same period of 1935, the gasoline consumption in Nebraska increased only 94,000 gallons. The same period in Missouri shows an increase of nearly 18 million gallons; 10½ million increase in Iowa; nearly 15 million increase in Kansas; and over 8½ million increase in Colorado. Iowa and Kansas each has a 3-cent gasoline tax, Colorado a 4-cent tax, and Missouri a 2-cent tax.

These figures graphically picture the results of burdensome gasoline tax increases and the evil results of diversion —but that is another story.

Several authorities insist that if Nebraska had a 3-cent gasoline tax instead of its present 5-cent tax, there would be little or no use for the ports of entry in that mid-western State.

In 1935 New Mexico adopted a port of entry law modeled closely after the original Kansas Act. Some 60 officers are required to staff the 22 ports and their time is taken with the collecting of license plate fees, stopping and licensing caravan cars and salesmen in out-of-State cars. No weighing facilities are provided and safety inspections are limited.

The system has apparently been successful in a financial way, and small wonder. New Mexico is definitely a bridge state between southern California and the East. The first year of operations showed collections of $30,709.50 in caravan fees; $77,297.41 in foreign plates; and $66,538.29 in State plates. With a minimum of through highways to guard, the expenses fell considerably below the total of $174,545.20.

UNLIKE Kansas, Oklahoma and New Mexico, Arizona operates a very thorough-going port of entry system without benefit of specific legislative authority. Taking advantage of the increase in highway patrolmen authorized by the 1933 legislature, the highway department established six inspection stations that year. Despite the fact that a port of entry proposal was tabled by the legislature in 1935, the number of these stations was increased to eight.

Caravan cars are taxed; plate fees from salesmen traveling in out-of-State cars are collected; carrier fees and weight taxes are assessed. No reciprocity is granted to foreign commercial vehicles. Some inspection as to truck lights and other equipment is attempted.

In addition to these ports, there are six quarantine stations so located as to complete the picture.

In both Arizona and New Mexico

THEN AND NOW

PORTS of ENTRY Turn Boundaries into Barriers

they energetically seek to nab the salesman and force him to buy a special license for his car. It has been variously estimated by different authorities that 60 per cent of all the automobiles on the highways are engaged in business affairs. These local requirements, therefore, discriminate against the salesman, and especially against the salesman traveling by auto rather than by rail.

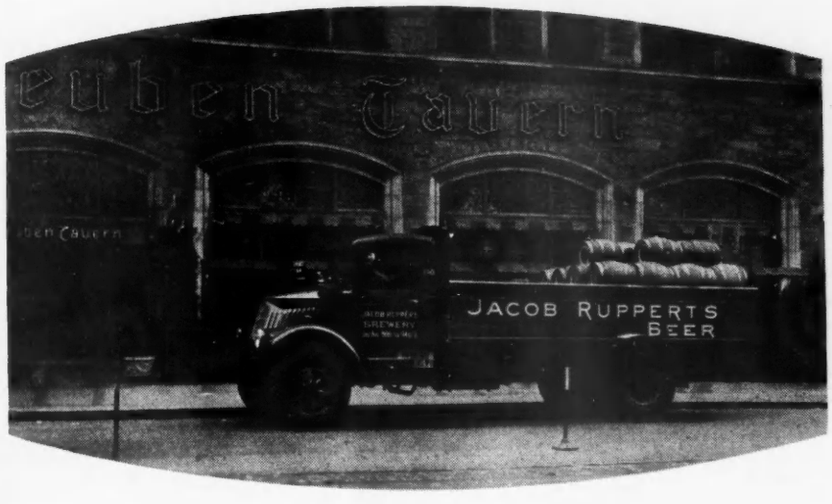
CALIFORNIA was one of the first of the western States to establish highway checking or quarantine stations for agricultural inspections as a preventive measure against plant diseases and fruit pests. Eleven permanent or year-'round stations and 14 seasonal stations are operated during the summer months.

In 1927 the Motor Vehicle Department of the State placed "general registration assistants" at some of the quarantine stations to aid in the enforcement of the registration provisions of the State Motor Vehicle Act. They issue nonresident permits; check automobile registrations; require registration of foreign commercial vehicles and the automobiles of salesmen; watch for stolen vehicles; and disseminate general travel information. A number of highway patrolmen are also assigned to duty at the various checking stations.

The delays occasioned at the California frontier are often most annoying to the traveling public. Although picked men are on these appointed jobs, complaints are frequently heard, particularly from motorists who object to having their baggage opened and inspected. Some cases have been known where inspectors have actually been assaulted in the performance of their imposed duties. While the efforts of the State Department of Agriculture in preventing incursion of plant diseases and fruit pests are generally approved throughout the State, two questions naturally arise: First, is it necessary to search the baggage of automobile tourists? and, second, if it is, why is it not also necessary to search the baggage of railroad travelers? It would seem most difficult to justify this discrimination.

Last year (1935), 360,417 out-of-State vehicles passed through and were inspected in these stations.

COLORADO was the latest western State to join the port of entry procession. For many years that State held open its doors to the drivers of foreign vehicles, but the enactment of port of entry laws in Kansas, Oklahoma and New Mexico and the continued refusal of Wyoming to grant reciprocity to Colorado commercial vehicles led to a demand for retaliation. As a result the so-called Highway Courtesy Patrol was established by the 1935 legislature. That law authorizes ports of entry in the discretion of the officials. Permanent ports have been established at Fort Collins and at Trinidad, near either end of the Colorado Common Point line. Trailers are utilized in operating six movable ports, three officers being assigned to each. These have been giving roving commissions.



In addition to checking permits of public carriers, guarding against gasoline tax, license fee and ton-mile tax evasions, it is also the duty of these inspectors to assist tourists. They also inspect commercial vehicles for safety requirements. No effort is made to collect license fees from salesmen traveling in out-of-State vehicles.

UTAH for some years has operated movable checking stations. These are in the form of specially built trailers attached to automobiles operated by regular highway patrol officers. They move from point to point throughout the State checking up on truck traffic wherever contacted. One permanent station has been in operation for some time near the southern border of the State near the heavily traveled highway between Salt Lake and Los Angeles and at the present time two additional permanent stations are being placed in operation—one on the San Francisco route, U. S. 50, and the other between Salt Lake and Ogden. With the completion of these units, only one movable station will be kept in operation.

Utah officers collect license fees and ton-mile taxes, check on public utility permits, and make safety inspections. Out-of-State trucks formerly were granted the right to several free trips into the State during the year, but since this privilege has been abolished, the checking stations have become increasingly active in regard to foreign-licensed commercial vehicles.

THE panhandle of Idaho has been geographically thrust between the States of Montana and Washington. While it may be crossed in a very few hours, it has long been a problem to the interstate trucker. It lies effectively across the direct route between the Pacific Northwest and the East. Of late, the State has increased its vigilance in its attempt to guard its highways and increase its road revenue.

As a result of agitation leading to a special legislative session and the enactment of a caravan tax law, Idaho in the spring of 1936 established a checking station on U. S. Highway 30 just east of Pocatello. At the present time, six such stations are in operation at strategically located positions.

MAINE has established a series of stations or barracks, not exceeding six in number, at various points along the main highways entering the State. These stations are operated by the State highway police and provide scales for the weighing of out-of-State trucks; and the checking of "under registration" and overloading.

Registrations are checked and deficiencies in the fees collected, after which clearance certificates are issued. The operation has so far been inexpensive, with collections materially exceeding the cost. The enforcement is necessarily sketchy.

Actually, this is not a port of entry system, but there are interests now urging its extension and enlargement.

ONE of the principal criticisms frequently heard is directed at the political angle of the question. Most of the ports have three or more men employed and, while it is vigorously

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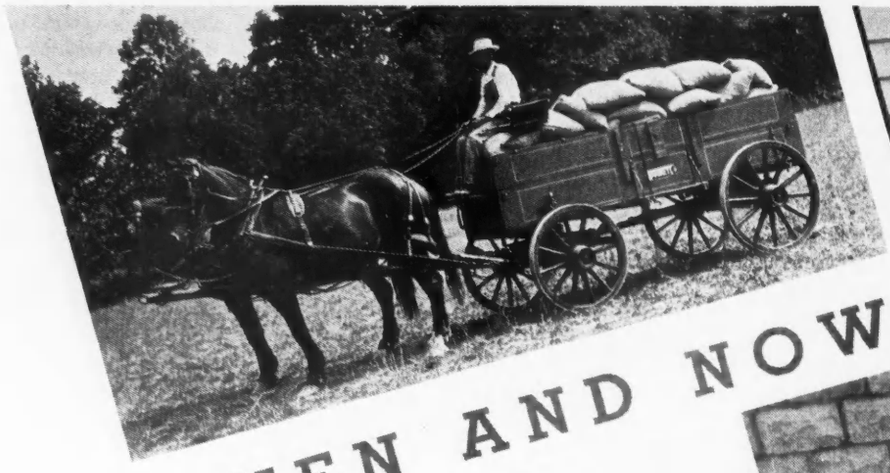

THEN AND NOW

THE POWER ALCOHOL Lag

The Legislative Spree of Advocates of Alcohol-Blended Gasoline Menaces Highway Transportation With a $500,000,000 Rise in Fuel Costs

GASOLINE has made the internal combustion engine economically practicable. A constant, adequate supply of low-priced motor fuel, more than any other single factor, has been responsible for the widespread use of automobiles today.

Nevertheless, there have appeared at intervals during the past 60 years, repeated dire prophecies of a threatened petroleum shortage. The present estimate of recoverable petroleum reserves of the United States is, however, higher than the estimate of 15 years ago, while the price of gasoline has been cut almost in half during the same period. These facts would seem to imply that no critical situation of petroleum scarcity is likely to arise for several decades to come.

For the past 25 years, many scientists, both here and in Europe, have sought an adequate substitute motor fuel. Experimentation has ranged widely — from kerosene carburetors, chemical substances to be added to certain fluids, gas to be generated from straw and other waste materials, to combinations of benzol, alcohol and the like.

None of these substitute products can be manufactured and marketed as cheaply as gasoline. However, there has been considerable agitation in recent years in favor of a policy of blending certain percentages of alcohol made from farm products with gasoline for use as a motor fuel; principally because such policies are being pursued in a dozen or more European countries, where waste agricultural products pro-

By V. A. LESLIE, Economist, American Petroleum Industries Committee

vide the raw material for the fuel alcohol.

THE situation which brought about fuel-blending in Europe is markedly different from that prevailing in this country. After the World War many European nations found themselves faced with large surpluses of farm products and poverty-stricken farm populations; and, with the exception of Russia and Rumania, these nations were totally lacking in petroleum resources.

In addition, these nations rapidly developed intense nationalistic viewpoints and barricaded themselves behind steep tariff walls. As a result of these governments' efforts simultaneously to relieve their agricultural difficulties and to attain commercial self-sufficiency for better defense in the event of war, they embarked upon fuel-blending programs. Another contributing cause to this end was their lack of adequate gold reserves, and in the face of an unfavorable trade balance, their inability to pay for large petroleum imports.

So, through the medium of legislation compelling the blending of alcohol in motor fuel, these nations set out to reduce farm surpluses and further their nationalistic aims. In many ways, however, it proved a tragic error.

The fuel-blending nations found their costs of motor travel greatly increased through the new policy, while the farmers, receiving miserably low prices for their products, were little better off. In fact, in most instances motorists were unable to pay the entire additional fuel bill, and a governmental subsidy, levied on the general taxpayers, including the farmers, was the solution for most of the nations involved.

AS shown in the accompanying table, the total gross costs of fuel-blending in the eleven European countries analyzed were, for 1935, $152,884,000. This very appreciable sum includes the portions borne by governments, motorists and taxpayers, together. Extremely little of it represents profit of any kind—whether to a government monopoly or to government-subsidized private alcohol manufacturers.

The waste and inefficiency of this system may be clearly visualized when it is considered that the total amount of alcohol consumed—206,337,500 gallons—could have been replaced by straight gasoline at an imported cost of only $12,970,000.

In other words, the net loss accruing to these European nations by reason of their alcohol-blending fuel policies is approximately $140,000,000 annually—certainly a tremendous sum for a group of relatively impoverished nations to pay for a few doubtful benefits.

Furthermore, the European experiment apparently has revealed that in addition to its exorbitant cost, alcohol-gasoline does not perform satisfactorily in internal combustion engines. A tacit admission of this is seen in the fact that most of these fuel-blending nations have provisos in their laws permitting airplanes, ambulances and fire-fighting equipment to use straight gas.

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In the last analysis, it would have cost this group of European nations far less to have imported gasoline and to have provided vast storage facilities to handle it, rather than to have shouldered the tremendous burden of an uneconomic, tax-subsidized alcohol industry.

The experience of Europe with blended fuel seemingly would have discouraged American experiment along similar lines. Nevertheless, in the depths of the depression, in 1933, an identical program was urged for the United States, to be accomplished by means of legislative compulsion.

The purpose behind the proposal was exceedingly laudable. Its sponsors contended that the plan would eliminate the huge agricultural surplus that was cramming our granaries to the bursting point, and would assist the farmer by raising the price of corn and the demand for it simultaneously.

A BILL to compel alcohol blending was introduced into Congress, but the economic deficiencies of the measure were so apparent that the proposal was defeated. Similar measures also were introduced in the legislatures of several corn-producing states, but these bills also met with defeat, and for the same reasons—economy.

Speculation on the probable costs of fuel-blending, were it ever to become compulsory in this country, is interesting. Of course, no truly comparable basis exists whereby the actual European results may be analyzed with the probable American results. The reason, of course, is that the economic and political conditions governing the two areas are in such contrast.

American industrial efficiency is at a high level, when compared to the corresponding economic factor of Central Europe. Therefore, it would be reasonable to expect that the manufacturing costs of alcohol in the United States might be lower than the identical cost figures for Europe.

However, the American standard of living so far exceeds that prevalent in Central Europe that essential labor costs would be infinitely greater here. Since this factor applies equally well to the farm population in the two areas, raw material prices in the United States would logically be much greater than those paid to European agricultural producers. This same ratio is maintained in the costs of coal or other fuel for the complicated and expensive distilling process.

All of these factors have been encountered in the experiments of the United States Department of Agriculture, which, in its Senate Document No. 57 of the 73rd Congress, reports that under wage conditions then prevailing, a gallon of anhydrous alcohol would cost 51.5 cents to produce if corn were selling at 75 cents per bushel. This figure also gives full allowance for the sale of the processed mash as a cattle feed. However, few farmers would consider corn at 75 cents per bushel particularly profitable to themselves.

As a matter of fact, corn is now selling for $1.13 per bushel or thereabouts; therefore, alcohol probably would cost about 70 cents per gallon. A blend of 10 per cent alcohol thus would add about six cents to the per-gallon sales price of our motor fuel, when due allowance is made for the cost of gasoline replaced by alcohol.

It would be foolhardy to attempt calculation of the approximate annual cost of an alcohol-blending policy to United States motorists and taxpayers, because of the widely varying cost factors. However, it seems safe to estimate that this cost figure would range between $500,000,000 and $1,000,000,000—on the basis of present demand for motor fuel. And the worst of this situation is that it would be an *unnecessary* loss.

IF alcohol were regarded as the *sine qua non* of motor fuels, which it is not, there is an amply abundant and far cheaper raw material source for it; namely, blackstrap molasses, the crude waste from the refining of sugar. It can be imported for a few cents a gallon, and is enormously productive of alcohol when distilled.

Unfortunately, this molasses, from which 85 per cent of the United States alcohol production was manufactured in 1935, is not a product of our country's agriculture. It must be imported from Cuba. Even by utilizing this cheapest of raw materials, however, anhydrous alcohol will cost at least four times as much to produce as will a corresponding quantity of gasoline.

In view of steadily increasing prices for farm products since 1933, and particularly in recent months as a result of drought conditions and crop limitations which will compel the importation of millions of bushels of corn from the Argentine and wheat from Canada, one might feel he could safely assume alcohol-gasoline to be a dead issue. On the contrary, it is still being advocated with considerable determination by its proponents.

AS a farm-aid measure, alcohol-gasoline would be a fallacious expedient. The reason is that the American farmer consumes about one-quarter of the nation's motor fuel; therefore, the average farmer would be one of the individuals most heavily penalized by alcohol-increased costs of this motor fuel. Economists believe this extra fuel cost would far outweigh any minor benefits

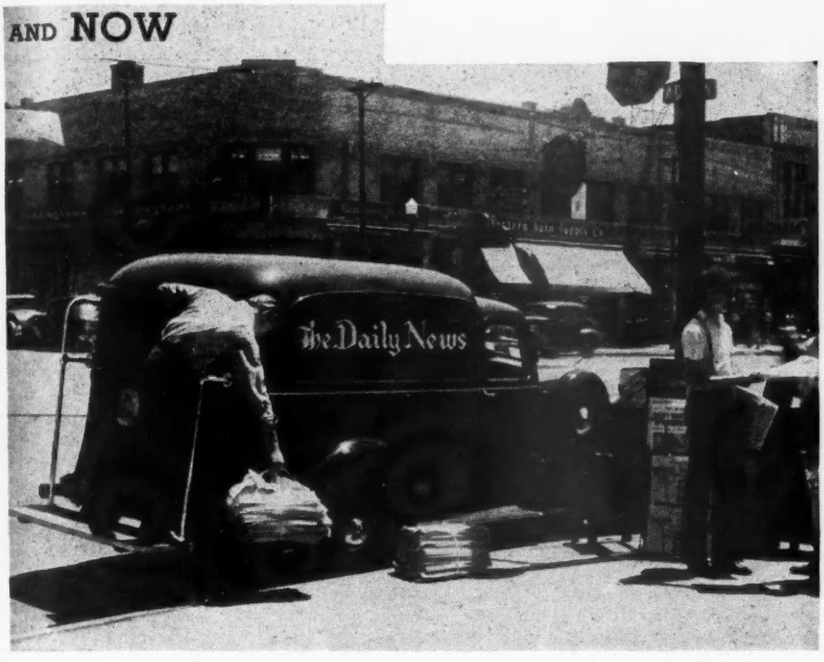
THE POWER ALCOHOL jag

TABLE I

Cost of Fuel Alcohol in Eleven European Countries (1935)*

Country	Quantity Consumed (American Gallons)	Price of Alcohol (Cents per Gallon)	Number of Motor Vehicles	Population	Population Per Motor Vehicle	Cost per Vehicle	Total Cost of Alcohol Fuel To Country
Austria	1,575,200	57	46,472	6,762,687	185	$ 21.74	$ 793,000
Czechoslovakia	15,206,800	76	126,356	15,057,000	120	44.28	5,549,800
France	105,108,800	27	2,065,200	41,940,000	20	37.54	77,529,000
Germany	64,440,000	76	1,122,000	65,804,000	59	54.98	61,688,000
Hungary	3,125,700	79	16,082	8,894,920	553	128.84	2,072,000
Italy	1,790,000	88	395,727	42,625,000	108	4.98	1,577,000
Jugoslavia	2,349,000	40	10,400	14,730,000	1,416	21.83	227,000
Latvia	1,933,600	59	4,158	1,939,350	466	338.63	1,408,000
Poland	2,126,900	19	25,734	7,177,000	1,283	33.08	851,000
Spain	4,296,000	52	194,209	28,719,000	148	1.05	204,000
Sweden	4,385,500	31	159,083	6,233,090	39	6.28	986,000
TOTAL OR AVERAGE	206,337,500	48.4**	4,154,421	239,882,047	58	$36.80	$152,884,800

* From Automobile Facts and Figures, 1936. Also Dr. Oskar Tokayer, in World Petroleum for June, 1936.
** Weighted average.



the farmer might receive in the rise of corn prices a few cents per bushel.

From an economic standpoint, alcohol-gasoline probably would weigh most heavily upon the pocketbooks of the United States' 26,000,000 motorists—each of whom now pays an average *additional* tax burden of $46.26 annually. It scarcely would seem just to increase motorists' expenses, merely for the purpose of experimenting with a probably unsatisfactory and a certainly unnecessary motor fuel.

APPROACHING the problem from the viewpoint of national welfare, one may concede that compulsory alcohol-blending might delay the eventual depletion of domestic petroleum reserves by a few years. However, it is virtually certain that in the long run the country would be better off without it, because increased planting of corn would be rendered unnecessary, and corn is one of our most soil-exhausting crops. Abandoning the alcohol-gasoline idea, then, would constitute an important step toward soil conservation.

Finally, it may be concluded that alcohol-gasoline can never compete equally in the fuel market without the economic boost of legislative compulsion in its use, or an indirect subsidy to be derived through the establishment of tax differentials.

These principles of favoring one industry at the expense of another, or compelling the individual to use a product which he feels is not adapted for his best interests, have been and are completely foreign to the American temperament and the American legal system. It is difficult to imagine, therefore, how alcohol-gasoline ever can achieve sufficient popularity to assure its establishment as an integral part of United States' industrial policy.

Ports of Entry Turns Boundaries Into Barriers

(CONTINUED FROM PAGE 49)

claimed that their positions are non-political, there is a persistent rumor that the recent changes in personnel of the Oklahoma ports were a direct result of a political shake-up. One of the members of the Nebraska legislature, either more naive or more frank than his brothers, made the following illuminating statement: "Mr. Speaker, I vote aye on this bill because I am reliably informed it will give employment to more than 120 men."

Generally speaking, the officials of port of entry States vigorously defend the theory—a most natural attitude that must, of course, be expected. More to the point, however, we find the railroads, many large motor carriers and others, who are safely entrenched behind the barricades, are well pleased with the protection thus afforded them against competition from other States.

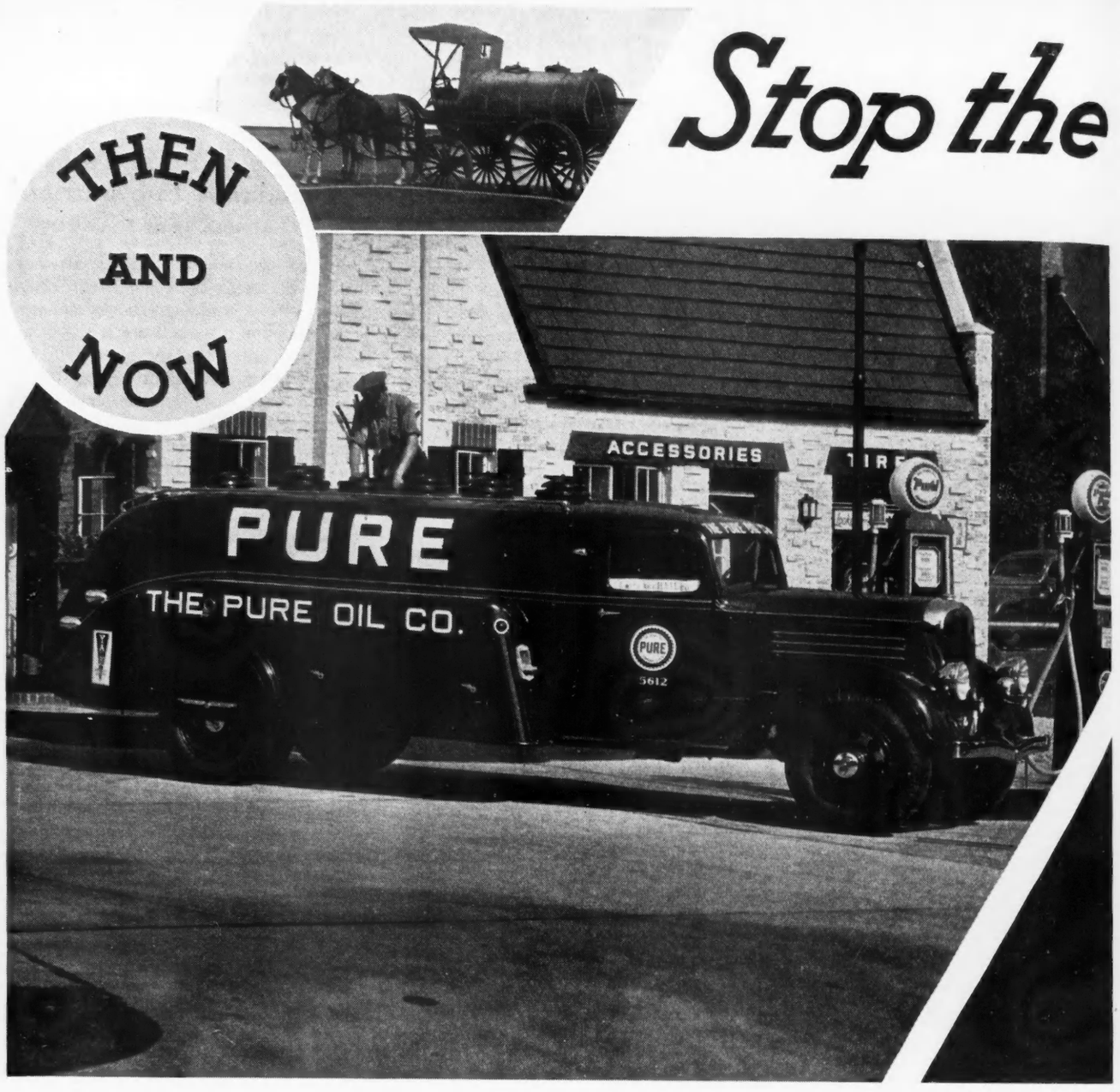
The railroads are probably the greatest force behind the port of entry idea. In many of the States, railroad attorneys either initiated or assisted materially in securing the passage of the legislation. Last spring the presidents of the Boston & Maine, the New York Central, the New Haven, and the Pennsylvania, in a formal communication to the Governors of the six New England States, vigorously urged "the use of the 'port of entry' principle of charges for use of the highways, similar to that used by the State of Kansas."

This country has progressed well under its free flow of commerce; and as long as the several states were willing to follow the underlying spirit of our union, our commercial improvement was continuous and outstanding in comparison with the rest of the world.

The idea of the port of entry is not new. The Rhenish chieftain knew its possibilities for levying tribute. The ancient system of octroi was in vogue for centuries and has only been completely discontinued in Italy and Egypt during the past decade.

European countries always have suffered from the ill effects of their frontier barriers, not only in their restricted flow of commerce but in their absolute inability to live with each other in amity. There is sound objection in principle to this idea of setting up "frontiers" at the borders of our 48 States.

Stop the



THE evasion of gasoline taxes constitutes one of the most serious problems confronting state tax administrators. While the extent of gasoline tax evasion is difficult to estimate, it is a generally accepted fact that the 48 state governments lose millions of dollars in revenue annually as a result of the activities of gasoline tax racketeers.

Nor has the petroleum industry, which believes firmly in the principle of a reasonable gasoline tax for highway purposes, failed to suffer as a result of tax evasion. Chaotic market conditions, customer dissatisfaction and heavy losses to legitimate dealers as a result of bootleg-inspired price wars are a few of the evils accruing from tax evasion.

Following the repeal of prohibition in 1933, a large number of the bootlegging and beer-running gangs found themselves obliged to look around for another racket. Many of these racketeers decided gasoline bootlegging offered one of the best and most "foolproof" fields for heavy profit.

Bringing to gasoline tax evasion the methods and organization that had proved successful in the bootlegging of liquor, these gangs soon attempted to move large quantities of gasoline on which taxes never had been, nor never were to be, paid. For retail outlets for the smuggled gasoline, they either operated their own filling stations or persuaded small and greedy operators to handle the contraband motor fuel.

To understand the growth of tax evasion in the petroleum industry, it is necessary to realize the potential profit available to unscrupulous persons in the gasoline retail business. The reason such large profits are possible through tax evasion, is, of course, the enormously heavy tax burden which is imposed upon gasoline, one of the principal products of the petroleum industry.

This burden consists of tax rates ranging in the various states from two cents to seven cents on every gallon of gasoline sold. In addition, there is a federal gasoline tax of one cent on every gallon sold in the entire nation.

The gasoline tax is really a sales tax, a sales tax averaging from 30 per cent

Gasoline Bootlegger

By BAIRD H. MARKHAM, Director, American Petroleum Industries Committee

to 100 per cent, depending on the tax rate. With a differential of this amount involved, the opportunity for illicit profit can readily be realized. As a matter of public record, the revenue from state gasoline taxes alone in 1935 was $616,851,671. The federal gasoline tax added another $172,262,481 to this amount.

Naturally, the impulse to evade this tax is greater in the high-tax states, although those states with the lower rates are not neglected by the tax evader. The high-tax states are, however, considerably more numerous than the lower tax ones, so the tax evader has ample opportunity to ply his nefarious trade.

In only two states, and the District of Columbia, is the tax as low as two cents a gallon. In eleven states it is three cents, in 17 states four cents, in nine states five cents, in five states six cents, in one state six and one-half cents and in three states, seven cents.

Incidentally, tax experts have calculated that a gasoline tax of more than three cents per gallon constitutes an inducement to evaders. Obviously, with a margin of three or four cents to work upon, the bootlegger can afford to cut his price and thus attempt to steal the customers of the legitimate, tax-paying gasoline dealer.

IT has been estimated there are at least 99 methods of evading state gasoline taxes, but all of them are variations of four principal tax-evading procedures. These, specifically, are smuggling, diversion or misbilling of shipments, fraudulent refunds and exemptions, and substitution or misbranding.

Tax-evaders and racketeers are completely unscrupulous and tremendously resourceful. They stop at nothing to achieve their illegal ends, and only unrelenting campaigns, strengthened by laws providing for more stringent penalties for violations, will eliminate gasoline bootleggers from their iniquitous trade.

A GENERAL outline of typical methods employed by gasoline tax-evaders may be illuminating. The evaders may purchase bootlegged "hot" oil, pro-

duced in excess of allowable quotas, at a cut price per barrel. Through dummy corporations they may operate "wildcat" refineries—old plants rejuvenated or inefficient stills newly built—to provide their manufactured fuel.

This bootlegged gasoline, often poorly refined, may be moved in disguised tank trucks over the highways; it may be transported labelled as non-taxable kerosene in railroad tank cars; or it may be smuggled by barges or tankers if water routes are available. Since gasoline "in transport" between states is tax exempt by ruling of the Interstate Commerce Commission, it has been found that large shipments, consigned to out-of-state points, have later been diverted so that they never cross the state boundary.

IN the retail end of the racket, some professional tax-evaders may operate filling stations or chains of filling stations, either licensed or unlicensed, pocketing the gasoline tax as they collect it. They may either sell at prevailing market prices, clearing the legitimate dealer's profit as well as the tax differential, or they may undersell the honest, tax-collecting gasoline dealer by foregoing the normal margin and pocketing only the tax. The tax, however, is larger than any legitimate profit they may expect, so their "bargain" prices attract added patronage.

Still other racketeers may buy good grades of gasoline and even pay the tax upon it, or at least part of the tax. However, somewhere along its transport route it is "cut" or adulterated with non-taxable kerosene, naphtha, stolen casinghead gasoline, or distillates, to augment its volume and the subsequent sales profits. This blended motor fuel often is purchased by consumers who believe gasoline sold at cut prices is a bargain. Instead, it is very likely to seriously damage the engines of their motor vehicles. It is this fuel that constitutes the "stock in trade" of the racketeer in price wars, and to understand its origin is to comprehend supposed discrepancies in gasoline prices.

Falsified records, adulterated and blended fuels, hidden shipments, conspiracy and evasion are merely a few of the more common schemes employed by professional violators of gasoline tax laws. Seeking of fraudulent exemptions and tax refunds are others.

This latter method is possible because a number of states exempt from taxation gasoline consumed by motor boats, tractors, stationary engines, aircraft or in dry-cleaning. Thousands of gallons of gasoline attested for such uses eventually fall into the hands of law violators. In many cases, juggled figures, forged documents, corruption and bribery combine to circumvent efforts to check such movements of liquid fuel.

The petroleum industry believes that gasoline taxes should be collected in full. This industry always has endorsed the principle of gasoline taxation for road uses, provided the taxes are imposed at reasonable rates.

As a matter of fact, the petroleum industry is almost unique in that it performs the function, in the great majority of states, as the tax-collecting agent itself. This additional activity is estimated to cost oil companies a total of $22,500,000 annually.

Furthermore, the industry has cooperated and is cooperating fully toward stamping out the activity of tax evaders, whose illegal efforts disrupt price structures and penalize legitimate, tax-collecting dealers, and has taken a leading role in efforts to halt gasoline tax evasion.

Through the medium of the American Petroleum Industries Committee, considerable publicity has been given to the tax evasion problem. Committees and conferences have been organized to combat this evil.

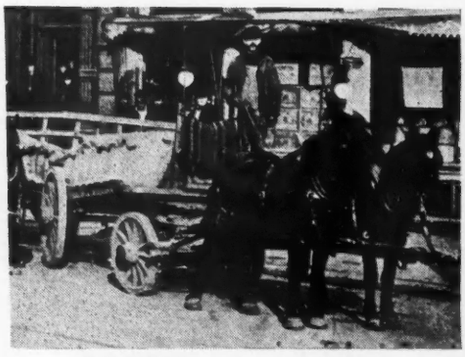
On several occasions the Committee and its affiliated organizations have employed investigators, auditors and attorneys, to assist the tax collecting authorities in certain of the states in eradicating gasoline tax evasion.

Not once has a campaign of this kind failed to show a substantial return in increased tax collections, and, in many cases, tax evaders have been indicted, convicted and punished. The industry has also assisted in organizing special highway and harbor patrols whose duty it is to halt smuggling of gasoline over state boundaries and arrest violators.

MUCH additional work remains to be done and many changes in laws and regulations must be effected, however, if gasoline tax evasion is to be eradicated. Happily, the states themselves have recently become concerned with this problem and several of them are taking effective steps to strengthen their tax enforcement activities.

It has been estimated that Mississippi will increase its gasoline tax collections approximately $2,000,000 annually following a thorough investigation and revision of its tax administration department. In the course of the investigation, 150 indictments have been returned by grand juries, principally for conspiracy to defraud the state by false billing of gasoline.

Tennessee only recently has taken the lead in organizing a cooperative system among 17 southern states in the effort to stamp out the evasion of gasoline tax payments. It is planned that all participating states shall exchange information concerning interstate shipments of gasoline on a monthly basis, as a means of checking on gasoline consigned as tax-free kerosene or otherwise falsely billed. An evasion investigation in Tennessee, under way only a few months, already has resulted in the indictment of 22 persons. New Jersey, New York and many other states also have recently prosecuted alleged tax evaders.



THEN AND NOW

Stop the

HOW, it may be asked, can we most effectively stop the gasoline bootlegger and tax evader? This result can be accomplished, but it will demand un-

remitting, intelligent effort to do so.

A primary requisite is effective administration of the gasoline tax law itself, which includes an adequate and efficient enforcement staff. Though an adequate enforcement staff may necessitate an increase in departmental appropriations, almost without exception, such increases have resulted in vastly augmented tax collections to the states.

All factors considered, efficient collection—rather than a high tax rate—constitutes the true measure of the financial productivity of the gasoline tax levy. In other words, it is cheaper, easier and more profitable to levy this tax at rates which are paid readily and willingly than to impose it at rates which strain the taxpayers' ability and willingness to pay and make tax evasion profitable.

Uniform tax laws and procedures are desirable, although due allowance should be made for unusual local conditions. As a matter of general policy, many students of gasoline taxation are inclined to believe that exemptions should be eliminated and refund provisions made more exacting. Distributors and dealers should be licensed, with provision for cancellation in the event of law violations. Distributors should be bonded in an amount sufficient to insure payment of the tax. Efficient highway and harbor patrols should be maintained to check gasoline smuggling.

Gasoline Bootlegger

OTHER legislative and administrative means which would aid in the abolition of evasion would be uniform regulations as to reports from all common carriers transporting motor fuel, to enforce the retention of records by distributors and dealers for at least two years and to make all such records available to public inspection. In the event of failure to pay, the amount of the tax should be a lien in favor of the state upon all property of the evader.

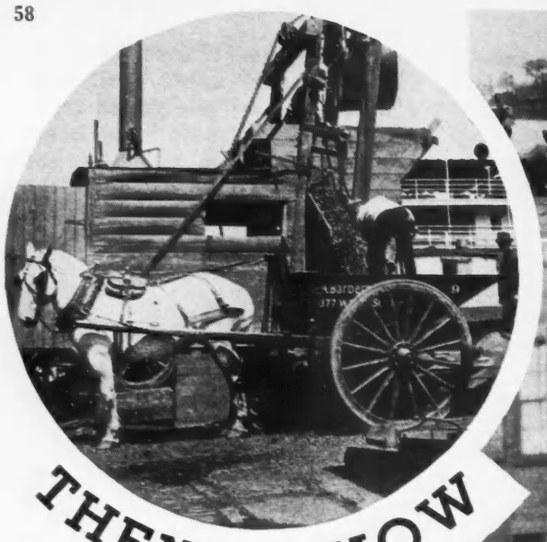
Penalties for all violations should be made much more severe than they now are, for there is no reason why they should not compare with the penalties for income tax evasion. Failure to pay should constitute embezzlement of public funds, to be punishable by fine and imprisonment.

Finally, state administrative laws should require and facilitate the exchange of information relative to gasoline shipments leaving each state. In this manner, such shipments may be constantly checked and discrepancies traced to the persons responsible.

Through strict adherence to uniform regulatory and administrative principles, the petroleum industry believes that gasoline tax evasion can be greatly reduced, if not entirely eliminated. The desired result, of course, is to secure for the states the revenue that now is being illegally pocketed by the racketeering tax evaders.

THE elimination of gasoline tax evasion in the average state would mean an increase in revenue amounting to many thousands of dollars. With these additional sums being collected by the state treasuries at negligible extra cost to the state, an opportunity would be afforded to relieve motorists of part of their inordinately heavy tax burden. This desirable end could be accomplished by reducing state gasoline tax rates, for with evasion eliminated, experience has demonstrated that a lower rate would produce the same revenue that is now being collected from a high rate.

Gasoline tax evasion can—and must—be halted. While the enforcement and collection of gasoline taxes are properly the functions of state gasoline tax administrators, the petroleum industry stands ready and eager to cooperate wholeheartedly with the government in stamping out this evil.



THEN AND NOW

Photos at top right show highway surveyors measuring a truck for load factors; car equipped with a "sight distance" rod; a scale attached to the steering post to determine degree of road curves

HOW ABOUT A

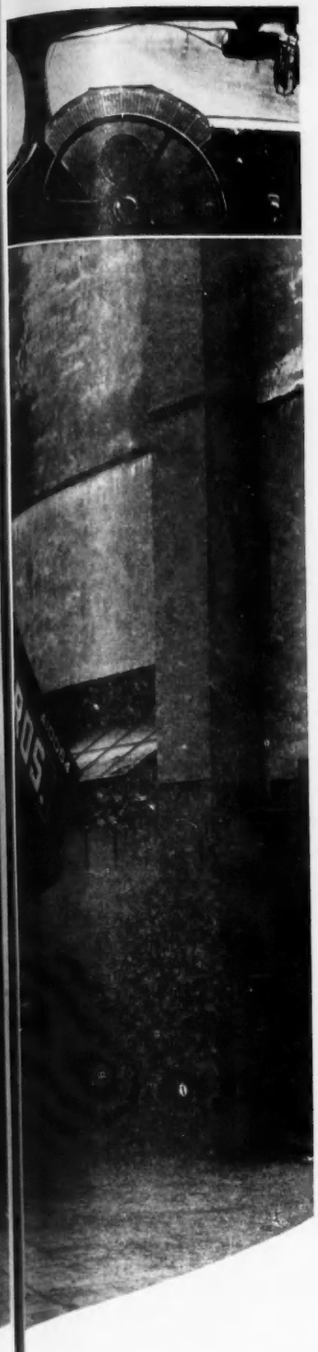
IN 38 of the 48 States, as this is written, the most comprehensive and detailed study of highway problems yet undertaken is in progress. In several other States similar work will soon begin.

Known as state-wide highway planning surveys, these studies are being conducted under the immediate direction of the several State highway departments, with the cooperation of the U. S. Bureau of Public Roads. They are financed largely by Federal funds, authorized especially for the purpose, supplemented, in most cases, by smaller amounts of State money.

With minor variations, necessitated by local circumstances, the survey in each State follows a common plan—a plan designed to bring to light all of the many kinds of facts needed to build a sound program of highway improvement and provide a fair and reasonable basis for the regulation and control of highway transportation.

For the first time, as a result of these surveys, the participating States will learn the true extent of their highway systems. Hitherto there have been no complete or accurate maps, and the public records and estimates of road mileage, except as to the small fraction in the State and Federal-aid highway systems, are known to be in error. For the first time, also, the survey will reveal accurately the existing condition of all highways and the extent to which each has been improved.

Against this record of what has thus far been done to improve the highways there will be set the most complete array of information ever assembled to indicate the need of further improvement. Vehicles using the roads will be counted. They will be weighed and measured. The origins and destinations of their trips will be determined. These and other facts of road usage will be determined so that, in the end, it will be possible to present a reasonably exact picture of highway transportation as it is—not only the transportation over the main highways, of which much is already known in several States from less extensive



UTA LEGISLATIVE Armistice

Until the U.S. Bureau of Public Roads Completes Its Nation-Wide Search for Highway Facts on Which Legislators Will be Able to Base Sound Proposals? Here is What the Search Will Reveal When Finished

By H. S. FAIRBANK, U. S. Bureau of Public Roads

earlier studies, but over all roads, down to the least important.

Here are some of the questions to be determined. To what extent is the traffic on our highways—the local roads as well as the trunk lines—a movement of passenger cars? What, similarly, is the percentage of motor trucks, and of busses? To what extent is the traffic commercial in character; in what part are its purposes those of pleasure or recreation? Of the commercial traffic, what part is a for-hire movement and what part a movement of vehicles transporting the goods of the private vehicle owners? To what extent is the traffic on all roads an inter-city movement; a movement between country and city; a movement between country points? What part of it is a short-range local movement, and what part of longer range, interstate, transcontinental? What are the exact weights and sizes of the larger vehicles—the busses and trucks? And, especially, how do all these characteristics of the traffic vary from road to road and from one class of roads to another; from the main roads to the local roads; from the highways of general use to the by-ways that serve the rural land?

As to all these questions, in the absence of exact knowledge, there have been wide differences of opinion, resulting in the unsettlement of public policy through conflicting counsel. It is hoped that the precise information that will be supplied by the surveys will serve to promote a better and perhaps general agreement upon many of these moot questions.

To supplement the indications of relative importance of the various roads afforded by the studies of the flow of traffic, the survey will also supply the first accurate knowledge of the location of farms, homes, churches, schools, stores, and other rural property in relation to the road system as a whole and, particularly, in relation to the roads thus far improved. This information will be especially important as a guide in deciding upon the order of improvement of the large mileage of local roads, because in the case of such roads the relative service they give to land and local property, rather than the density of the traffic they carry may be the determining factor in apportionment of improvement funds.

In a broader sense this first charting

A LEGISLATIVE Armistice

of the spread of residence and industry over the rural land will also permit an appraisal of the extent to which the work thus far done has brought the benefits of improved road service to the rural population. Until now only the roughest estimates of the numbers of farms directly served by improved roads have been possible; and means have been wholly lacking for the estimation of the additional numbers of farms and other rural properties that would be served by any projected extension of road improvement.

The facts revealed by the planning surveys will make exact determinations of this nature possible and for purposes of future highway planning — indeed, for all plans touching the future of rural America—they will be indispensable. This phase of the surveys will produce information of the widest usefulness and the utmost interest to every agency, company and person who for any reason needs to know how and where our rural population and industry are distributed, and how directly they are served with facilities of all sorts—economic, social, educational, religious.

THROUGH other departments of the surveys, information indicative of probable future changes in actual and relative uses of the highways will be sought. Trends in the distribution of population will be studied. Probable future changes in the utilization of land and the location of industry will be recorded. Observed changes in marketing methods and shifts from one form of transportation to another will be weighed; and the probable effects of all such trends upon the observed present usage of highways will be estimated as carefully and as exactly as possible.

To such a portrayal of the present adequacy of the highways and their present and probable future use, there will finally be joined the financial side of the picture—the taxation side—carefully and minutely drawn. The yield of all present highway taxes, direct and indirect, will be determined as exactly as possible, and each tax dollar will be traced to its origin to determine the extent to which it bears upon various population groups—the rural and the urban, the owners of motor vehicles and the owners of real property, the residents and taxpayers of various parts of the State and those of cities of various sizes.

The uses of the tax money will be examined in detail. In what part is it applied to various sections of the whole road and street system—to city streets on the one hand, and rural roads on the other; to main rural highways and local rural roads? To what extent is the money spent for construction, for maintenance, for debt service, for administration?

An effort will be made to ascertain what relation exists between the taxes paid by various population and taxpaying groups and the benefits flowing to the same groups from the expenditures as made. And finally, without mention of many of the details, the strongest possible effort will be put forth to establish with a practicable degree of accuracy those elusive elements of the highway cost equation—annual maintenance cost and the economic life of various types of highway improvement.

ALL these facts properly fitted together will provide a far better basis for rational planning of a highway program and for the equitable solution of highway transportation problems of all kinds than has ever before existed. And such a better basis is now badly needed. Until recently it has not been practicable to obtain such complete information. Not only were the means and facilities lacking; the very questions in their final forms were not yet posed. The whole highway industry was too young, too rapidly growing, to permit of any estimate of its final stature and relationship to the general economy. During this earlier period progress could be made in reasonable safety without such specific guiding information, because of the very inevitableness of that progress.

WE have now reached a point at which, with the pioneer growth behind us—the growth of the highways and the growth of highway transportation as a system—it has become possible to discern relatively lasting needs and relationships if we look for them.

In the improvement of the highways the most obvious, the most urgent needs have been met. Improved to some degree are roads that permit a reasonably free flow of traffic far and wide, that serve the great preponderance of the traffic from origin to destination, and the balance of it for the greater part of its movement. What remains is to build up to complete adequacy the roads already improved for pioneer service, and to extend the improvement effort to that remaining road mileage of secondary importance, which can be shown to justify such effort on economic or social grounds.

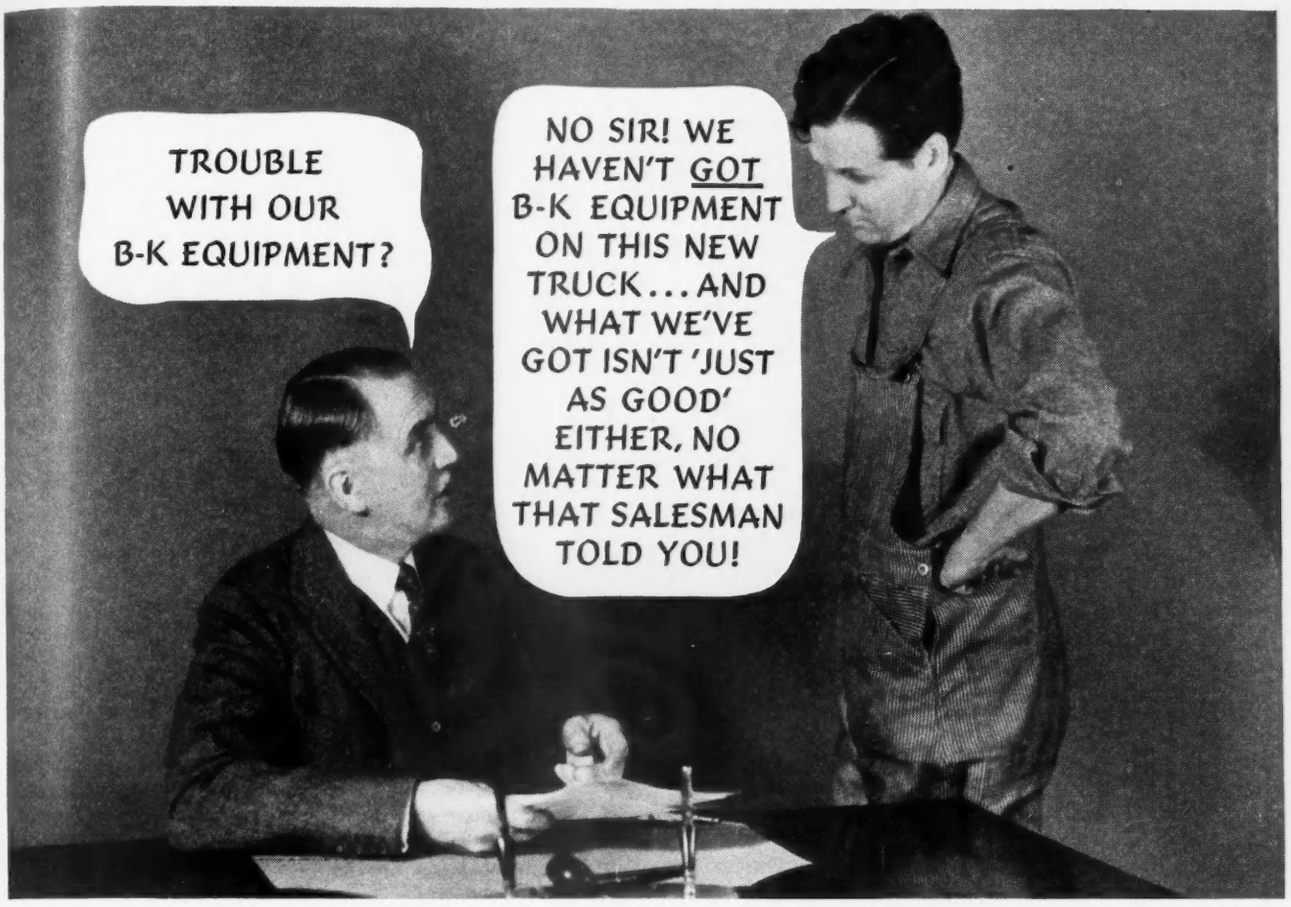
On account of recent great changes in the operating characteristics of motor vehicles, particularly the higher speeds, standards of highway improvement quite adequate only a few years ago are no longer sufficient. Because the more important highways, by very reason of their greater importance were first improved, and are now generally the oldest of the improved roads, these important roads—many of them—are in need of betterment to make them safe and adequate for modern traffic.

FOR the most part this needed betterment can be built into the existing highway structure in the form of modified curvature, reduced grades, lengthened sight distances, eliminated grade crossings of railways and highways, widened surfaces, and separated roadways for traffic in opposite directions where the traffic is heaviest. To a lesser and probably not great extent, new express highways on more ample and protected right of ways are indicated as the modern need. The real need and precise location of all such further improvements of the main highway system will be disclosed by the planning surveys—the *real* need and the *precise* location that must be distinguished from fanciful suggestions and vague and general appraisals too often put forward by visionary and academic enthusiasts.

Similarly, the surveys will substitute quantitative measurement of real and relative need of additional local road improvement for the clamorous but often ill-considered and too general demand for the improvement of every by-way.

WHAT the planning surveys attempt to do as a basis for decisions in regard to the further improvement of all our highways, is, first, to provide an accurate inventory of the highway facilities already possessed, a true and unbiased report of the flow and character of the traffic now moving, and an accounting of the highway costs already undertaken. To these facts, that have to do with the past and present, they aim to add others that will indicate what additional highway improvements are required for the service of the probable future traffic, and the probable cost of the whole highway system thus improved—not as a capital investment but as a continuing annual cost.

As the justifiable highway cost determined by such means must depend upon the amount and character of economical highway usage, and as, in large measure, the cost must in the end be paid by those who benefit directly by use of the highways, owners, operators, and manufacturers of motor vehicles have a special interest in the planning surveys which merits their particular attention to the work in progress and to its results.


TROUBLE WITH OUR B-K EQUIPMENT?
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It's the *only* way, and we can prove it. All we'd need to do would be to show you some of the letters we've received from truck owners who *thought* they were getting Bendix B-K, but got something else instead. Then, when the troubles arose, they wrote indignantly to Bendix! There's nothing to do about it but tell you, and all other Power Brake users, and to remind you of this fact:

96% of all Power Braking installations in service are Bendix . . . there must be reasons!

There *are* reasons, and the most important of them are listed at the right!

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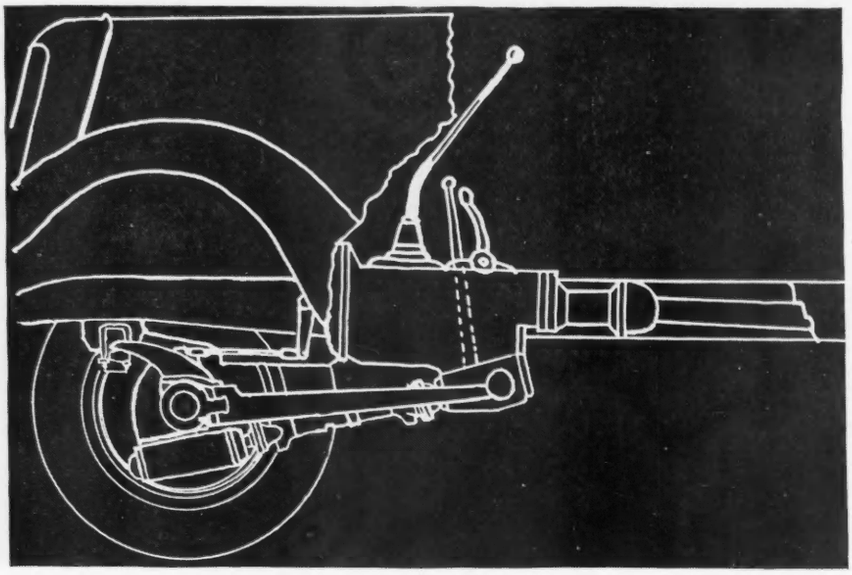


Alma Front-Driving Axle and Transmission Assembly for Ford, Chevrolet

FEATURING a one-piece transmission with a straight-line torque tube drive, Alma Motor Co., Alma, Mich., announces a new design front driving axle and transmission assembly for Ford and Chevrolet trucks.

As will be noted from the illustration, the conventional lengthy, unenclosed forward propeller shaft has been succeeded by a fifteen-inch, torque tube enclosed drive which eliminates the usual two universal joints working at permanent angularity.

The axle is the first production drive to employ the cone worm, produced under licenses from the Cone Worm Gear Corp. Due to the high load capacity of this form of gearing, the torque capacity of the unit as a whole is multiplied several times without increasing dimensions of the differential housing.

The axle features inclined kingpins, for the first time in a front drive, giving normal steering geometry.

In the one-piece transmission, the drive includes a device, termed by the manufacturers a "Travelizer," which equalizes the combined revolutions of the front and rear wheels, delivering torque to the axles in ratio to their traction and preventing shaft wind up from unequal travel.

The transmission as shown includes both the standard Ford and Chevrolet transmission gears in the same case with transfer and reduction gears in such a manner that the entire assembly bolts on to the standard Ford or Chevrolet bell-housing. The creeper gear operated by a lever in the cab gives eight forward speeds with low-low of 84:1 when used with a low-speed transtransmission. Like previous models of the drive the new drives are equipped with a declutching lever in the cab permitting optional use of the front drive at any speed.

Stress analyses by independent engineers as well as the Alma Motor Co. engineers are said to indicate that the new drives are the most powerful for their size ever developed, being capable of transmitting the maximum torque of the Ford or Chevrolet engine in creeper gear with a 100 per cent overload capacity.

The manufacturer states that the axle is capable of use as a front drive alone, if desired, by virtue of its compact size and high capacity. The use of front drive alone is a distinct advantage in many classes of use. By eliminating the usual midships auxiliary transmission, the new Alco Drives leave the entire chassis, from the second cross member back, free for installation of hoists or other equipment. It is pointed out that this feature is also important for military ordnance work where gun mounts and other installations are necessary.

Fully enclosed constant velocity universal joints have been utilized at the front wheels with a novel method of construction relieving all separating strains on the joints.

Provision is made for installation of power takeoff on the transmission in the usual manner.

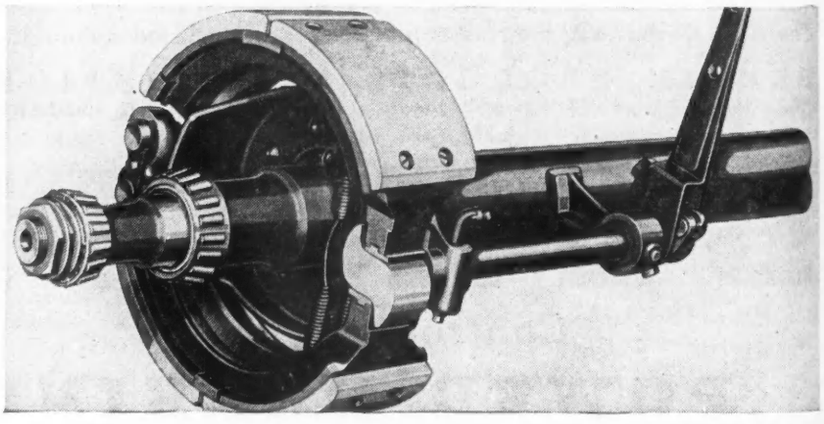
The entire unit has been so constructed that it can be installed on the truck by any average mechanic in a few hours' time, in the field, and is shipped to the dealer completely assembled with installation instructions. No change is made in the chassis engineering and not even one hole need be bored for installation, which the manufacturer terms a "wrench job."

Plant facilities of the Alma Motor Company, located at Alma, Michigan, are being retooled and expanded for a capacity of 6,000 units a year of the new drive and company officials state that allowing for the back-log of initial orders, general deliveries are expercted to start in January. Distribution is entirely through the approximately 16,000 Ford and Chevrolet dealers.

New Timken 12,000 lb. Axle

TIMKEN has added to its famous line of "Weld-Bilt" tubular trailer axles a new one of 12,000-lb. capacity, equipped with 16½x5 in. mountain-type heavy-duty two-shoe brakes. This new unit, designed for logging and heavy hauling operations on steep mountain grades, is known as the "T-12003-WM" trailer axle. It possesses the "Weld-Bilt" features of electrically butt-welded alloy steel spindles with integral brake mounting flange, and positive locking device for the micrometer adjustment of wheel bearings.

Timken has recently made available a new 16-spline torsion flow axle shaft.



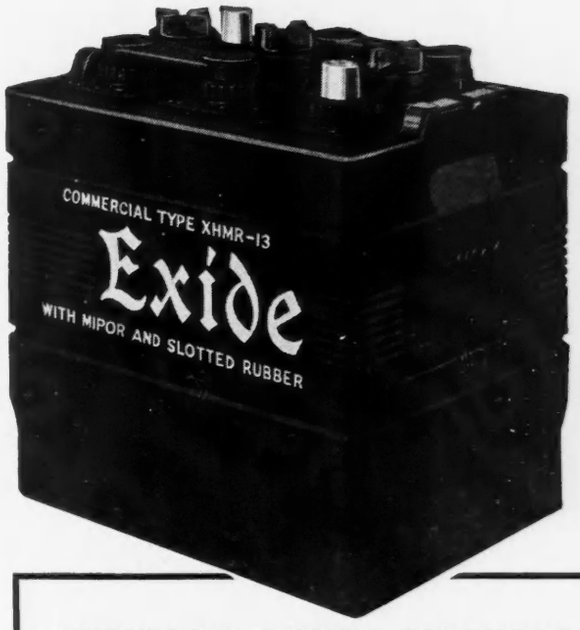
Forget all winter starting-troubles

with the new Exides for commercial vehicles

Here is a line of four new batteries built from the ground up to bring rugged, dependable battery-power to more than 90% of all commercial vehicles. They are equipped with Mipor, the permanent separator, and with slotted rubber also. They equal or exceed the S.A.E. and U.S. Government Standards both for capacity and life. They assure quick starts in all weather, and cut your battery maintenance costs by delivering exceptional performance during a long trouble-free life.

In short, they are typical Exides made especially for this service, backed by all of Exide's experience and by long study of actual operating conditions with commercial fleets in all parts of the country.

For large trucks there is the regular heavy-duty Exide line that has made an outstanding record of dependability and economy in the hardest service. Write us for the name of the nearest Exide Wholesaler, who will give you complete details on the new line of Exide Commercial Type Batteries.



COMPARE THESE FEATURES

- Mipor and Slotted Rubber Separation
- High-Type Plates, almost 5/8" higher than standard
- Extra Heavy Hard Rubber Container
- Heavy Intercell Connectors
- Extra Electrolyte Space
- Large Sediment Space
- Quarter-Turn Vent Plugs

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Complete Truck Specifications Table Will Be Published in December

Line Number	MAKE AND MODEL	GENERAL (See Keynote) Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight with Max. Tires	Chassis Wt. (Stripped)	TIRE SIZES D-dual rear S-single rear Standard Front and Rear	Maximum Tire Size Furnished	ENGINE DETAILS Make and Model	No. of Cylinders, Bore and Stroke	Displacement	Comp. Ratio	Torque lb. ft.	Max. Brake H.P. at R.P.M. Given	Main Bearings Number, Diameter and Length	Governor Standard	TRANSMISSION Make and Mode*	Forward Sp'ds	REAR AXLE Make and Model	Gear and Type	Drive & Torque	Gear Ratio Range in High	FRONT AXLE Make and Model	Make Location Type Oper'tn	BRAKES SERVICE Lining Area	Drum Area	Drum Material	Hand Location Type	C-A Dimension (Std. W. B.)	FRAME Side Rail Dimensions	Type
1	Autocar (7) (N) RH	2½–6½	3250	164	182		6840	8.25/20D	9.75/20	Own 358	6–4¼x4¼	358	5.5	250	85–2300	7–3x12⅝	Y Own DF5	5 Own DF	5	Own DF	2F	H	6.49–7.89	Tim 32502	LO4IDV	466	693	c	2I	84	8½x3x¼	T
2	I-TR	6–9	3400	142	164		6800	8.25/20D	9.00/20	Own 358	6–4¼x4¼	358	5.5	250	85–2300	7–3x12⅝	Y Own DF5	5 Own DF	5	Own DF	2F	H	6.49–7.89	Tim 32502	LO4IDV	466	693	c	2I	82	8½x3x¼	T
3	(T) I-TR	6–9	3250	148	164		6800	8.25/20D	9.00/20	Own 358	6–4¼x4¼	358	5.5	250	85–2300	7–3x12⅝	Y Own DF5	5 Own DF	5	Own DF	2F	H	6.49–7.89	Tim 32502	LO4IDV	466	693	c	2I	84	8½x3x¼	T
4	(d) RHD	3–4	3720	148	164		7120	8.25/20D	9.75/20	Own 358	6–4¼x4¼	358	5.5	250	85–2300	7–3x12⅝	Y Own DF5	5 Own DF	5	Own DF	2F	H	6.49–7.89	Tim 35000	LO4IDV	466	693	c	2I	84	8½x3x¼	T
5	(N) D	2½–6½	3570	164	182		7180	8.25/20D	9.00/20	Own 358	6–4¼x4¼	358	5.5	250	85–2300	7–3x12⅝	Y Own DF5	5 Own DFA	5	Own DFA	2F	H	6.49–7.89	Tim 35000	LO4IDV	567	832	c	2I	84	8½x3x¼	T
6	(N) DP	3–4	3875	164	182		7750	9.00/20D	10.50/20	Own 358	6–4¼x4¼	358	5.5	250	85–2300	7–3x12⅝	Y Own DF5	5 Own DFA	5	Own DFA	2F	H	6.49–7.89	Tim 35000	LO4IDV	567	832	c	2I	84	8½x3x¼	T
7	(N) DF	4–7½	4225	142	164		7710	9.00/20D	9.75/22	Own 404	6–4¼x4¼	404	5.5	295	97–2200	7–3x14⅜	Y Own DF5	5 Own TF	5	Own TF	2F	H	7.2–10.41	Tim 35100	LO4IDV	567	832	c	2I	84	9x3¼	T
8	(N) 2-DF	4–7½	4625	145	164		8260	9.00/20D	9.75/20	Own 404	6–4¼x4¼	404	5.5	295	97–2200	7–3x14⅜	Y Own DF5	5 Own N	5	Own N	2F	H	6.12–10.41	Tim 35100	LO4IDV	580	931	c	FD	84	9x3¼	T
9	(N) DN	5½–8	4650	164	218		8610	9.75/20D	10.50/22	Own 404	6–4¼x4¼	404	5.5	295	97–2200	7–3x14⅜	Y Own TF5	5 Own TF	5	Own TF	2F	H	6.12–10.41	Tim 26450	LO4IDV	580	931	c	FD	119½	9x3¼	T
10	(N) NFS	7½	5600	195	195		10380	10.50/20D	10.50/20	Own 404	6–4¼x4¼	404	5.5	295	97–2200	7–3x14⅜	Y Own TF5	5 Own TF5	5	Own TF	2F	H	6.12–10.41	Tim 35100	LO4IDV	580	931	c	FD	84	10½x3x¼	T
11	(N) NF	6–9	4900	164	218		9530	9.75/22D	10.50/24	Own 453	6–4½x4¼	453	5.5	333	108–2200	7–3x14⅜	Y Own DF5	5 Own N	5	Own N	2F	H	6.12–10.41	Tim 32502	LO4IDV	567	832	c	FD	84	8½x3x¼	T
12	(T) 3-TR	7–11	5000	148	164		8250	9.75/20D	9.75/22	Own 453	6–4½x4¼	453	5.5	333	108–2200	7–3x14⅜	Y Own TF5	5 Own TF5	5	Own TF	2F	H	6.12–10.41	Tim 35000	LO4IDV	580	931	c	FD	96	10½x3¾	T
13	(T) 4-TR	7–15½	5050	148	164		9170	9.75/22D	10.50/24	Own 453	6–4½x4¼	453	5.5	333	108–2200	7–3x14⅜	Y Own TF4	12 Own CGA	12	Own C	2F	R	7.2–10.4	Tim 26432	LO4IDV	580	931	c	FD	88½	9x3¼	T
14	(d) S	6–8	5850	170	170		9840	9.75/22D	10.50/D	Own 453	6–4½x4¼	453	5.5	333	108–2200	7–3x14⅜	Y Own TF4	4 Own CG	4	Own CG	2F	R	7.2–10.4	Own 54A1	TO4IA	659	1051	c	FD	129	10½x3¾	P
15	CE	7½	6000	172	203		11400	365–20D	10.50/24	Own 453	6–4½x4¼	453	5.5	333	108–2200	7–3x14⅜	Y Own TF4	4 Own TG	4	Own TG	2F	H	7.2–8.68	Tim 26452	TO4IA	580	1051	c	FD	102	10½x3¾	T
16	DH	4–5½	6600	204	204		10390	10.50/22D	11.25/24	Own 501	6–4½x5¼	501	5.5	375	123–2200	7–3¼x14⅜	Y Own TF5	5 Own TG	5	Own TG	2F	H	7.2–8.68	Tim 35100	TO4IA	580	1051	c	FD	68	9x3¼	T
17	(T) T	7½–10	6000	148	160		9560	10.50/22D	10.50/24	Own 501	6–4½x5¼	501	5.5	375	123–2200	7–3¼x14⅜	Y Own TF5	5 Own TF5	5	Own TF5	2F	H	6.5–10.1	Tim 27452	LO4IDV	659	1051	c	FD	90	10½x3¾	T
18	(T) 5-TR	8½–15	6800	170	170		11290	10.50/24D	11.25/24	Own 501	6–4½x5¼	501	5.5	375	123–2200	7–3¼x14⅜	Y Own TF4	12 Tim 7973W	12	Tim 58200	2F	H	7.8–10	TWH	4IH	384	785	a	FD	72	9H x3¼	C
19	(d) C	10–14																														
20	Available....	P-105 ¾–1	845	Op	Op	8500	2425	6.50/18D	6.50/20	Wau FC	4–3¾x4	133	5.8	98	36–2800	3–2¼x4½	N WG T9	4 Tim 51200	SF	A	**5.8	Tim 30000H	L4IH	250	366	a	TX	Opt	4x2¼	DD			
21	.....	P-106 ¾–1	940	Op	Op	8500	2675	6.50/18D	6.50/20	Con F6209	6–3¼x4½	209	5.7	164	71–3100	4–2¼x5⅛	N WG T9	4 Tim 51200	SF	H	**5.8	Tim 30000H	L4IH	250	366	a	TX	Opt	4x2¼	DD			
22	Federal....	(c.o.e.) 75	1½–2	1045	104	159	11000	3550	6.00/20H††	7.50/20	Her JXA	6–3⅜x4¼	263	5.3	149	64–2500	7–2½x10⅛	Y Cla. 185F	4	Tim 53521H	SF	H	5.14–6.2	Tim 32502H	L4IH	207	....	a	TX	60	8½x2⅞x⅝	T
23	.....	(c.o.e.) 80	2–3	1395	104	159	13000	3950	6.50/20D	8.25/20	Her JXB	6–3⅜x4¼	282	5.4	176	73–2500	7–2½x10⅛	Y Cla. 185F	4	Tim 53307H	SF	H	5.83–6.8	Tim 32502H	L4IHV	316	....	a	TX	60	8½x2⅞x⅝	T
24	.....	(c.o.e.) 85	2½–3½	1595	104	159	14500	4650	7.00/20D	9.00/20	Her JXC	6–4x4¼	320	5.6	204	84–2500	7–2½x10⅛	Y Cla. 200V	5	Tim 54411H	SF	H	5.83–6.8	Tim 32502H	L4IHV	344	....	a	TX	60	8½x2⅞x⅝	T
25	.....	(c.o.e.) 89	3–4	1995	104	159	16500	4950	7.50/20D	9.00/20	Her JXD	6–4x4¼								Tim 56411H	SF	H	6.16–7.4	Tim 32502H	L4IHV	360	....	a	TX	60	8½x2⅞x⅝	T
26	Reo.....	4-50 ½	555	114	120	4500	....	6.00/16D	6.50/16	Own	4–3⅜x4¾	140	5.4	98	45–2800	3–2¼x4⅛	N WG T84C	3 Spl			S½	H 4.55–4.90	Own	L4IH	198	242	c	TX	38¾	5½x2¼x¼	C
27	.....	6-50 ½	555	114	120	4500	....	6.00/16D	6.50/16	Own	4–3⅜x4¾	209	5.4	145	70–2800	4–2¼x5⅛	N WG T86	3 Spl			S½	H 4.55–4.90	Own	L4IH	198	242	c	TX	38¾	5½x2¼x¼	C
28	.....	4-75 ¾	615	114	120	5000	....	6.50/16D	7.00/16	Own	4–3⅜x4¾	140	5.4	98	45–2800	3–2¼x4⅛	N WG T84C	3 Spl			SF	H **5.10	Spl	L4IH	213	327	c	TX	38¾	5½x2¼x¼	C
29	.....	6-75 ¾	615	114	120	5000	....	6.50/16D	7.00/16	Own	6–3⅜x4¾	209	5.4	145	70–2800	4–2¼x5⅛	N WG T86	3 Spl			SF	H **5.10	Spl	L4IH	213	327	c	TX	38¾	5½x2¼x¼	C
30	Ward LaF (c.o.e.) H	¾	***	....	....	21000	....	9.00/20D	....	Wau MZ	6–4¼x4¾	404	6.5	254	85–2500	7–3⅝x12½	Y Fu 5A380	5 Wis 1337BH	5	Tim 58205H	2F	R	5.25–7.8	Shu 672B1	L4IHV	497	786	a	CD	....	12x3¼	T
31	.....	(c.o.e.) J	5	***	....	....	26000	....	9.75/20D	....	Wau MZ	6–4¼x4¾	404	6.5	254	85–2500	7–3⅝x12½	Y Fu 5A380	5	Wis 1337BH	2F	R	5.6–9.4	Shu 672B1	L4IHV	376	817	a	CD	....	12x3¼	T
32	.....	(c.o.e.) K	5–6	***	....	....	28000	....	9.75/20D	....	Wau SRK	6–4½x5⅛	472	6	330	110–2300	7–3x13⅞	Y Fu 5A620	5	Wis 1747K W	2F	R	6.0–9.2	Shu 673B12	W84IA	547	867	a	CD	....	12x3¼	T
33	.....	(c.o.e.) L	7½	***	....	....	32000	....	10.50/20D	....	Wau SRL	6–4½x6	572	6	420	125–1800	7–3¾x16½	Y Cla. 710	5	Wis 1747K W	2F	R	6.0–9.2	Shu 673B12	W84IA	547	867	a	CD	....	12x3¼	T
34	.....	(c.o.e.) LD	15	***	....	....	32000	....	10.50/20D	....	Cu. Die. HB	6–4½x6	672	17	420	125–1800	7–3¾x16½	Y Cla. 710	5	Wis 1747K W	2F	R	6.0–9.2	Shu 673B12	W84IA	547	867	a	CD	....	12x3¼	T
35	.....	(c.o.e.) MD	20	***	....	....	....	....	10.50/20D	....	Cu. Die. HB	6–4½x6	672	17	420	125–1800	7–3¾x16½	Y Cla. 710	5	Wis 1910W	2F	R	6.0–9.2	Shu 673B12	W84IA	547	867	a	CD	....	12x3¼	T
36	White....	(c.o.e.) 805	1½–2	1650	97	175	....	4895	7.00/20D	8.25/20	Own 270	6–3⅜x4½	270	5.5	195	83–2800	7–2⅝x13⅜	Y Own 44B	4	Own 25C	SF	H	5.10–6.83	Own 29D	L4IHV	368	557	a	TX	60	7x2⅜x⅞	C
37	.....	(c.o.e.) 809	1½–3	2250	97	193	....	5643	7.50/20D	9.00/20	Own 270	6–3⅜x4½	270	5.5	195	83–2800	7–2⅝x13⅜	Y Own 44B	4	Own 20C	SF	H	5.11–7.17	Own 23D	L4IHV	368	557	a	TX	60	7⅛x3¼x¼	C
38	.....	(c.o.e.) 812	3–5	2550	97	193	....	6600	8.25/20D	9.75/20	Own 303	6–3⅜x4½	303	5.5	215	92–2800	7–2⅝x13⅜	Y Own 41B	5	Own 26C	2F	R	7.23–8.95	Own 28D	L4IHV	491	767	a	TX	60	8x3¼	P
39	.....	(c.o.e.) 818	3–6	3275	....	....	....	6930	9.00/20D	9.75/20	Own 318	6–3⅜x4½	318	5.5	234	94–2600	7–2⅝x13⅜	Y Own 41B	5	Own 28C	2F	R	7.23–8.95	Own 28D	L4IHV	491	767	a	TX	60	8x3¼	P
40	**Four Wheel Drive**																															
41	Mar.-Herr.	B55T4	4½–5½	5400	158	Op	....	8100	9.00/20D	9.75/20	Her RXB	6–4½x5¼	501	4	330	110–2200	7–3x14	Y Fu 5A62	....	Tim 58200	SF	H	7.8–10	TWH	4IH	384	785	a	FD	72	9H x3¼	C

† Rear 40x8. †† Rear 32x6.

NEWS

Long Increases Facilities

The Long Mfg. Division of Borg-Warner Corp. has consolidated all its automotive clutch and radiator activities at its plant at Dequindre and Halleck Sts., Detroit. A new addition, 128 ft. by 700 ft., has been added to the clutch factory. Capacity daily production is now 3,600 radiators and 12,000 clutches.

Diamond T Sales Up 35%

All previous sales records of the Diamond T Motor Car Co., Chicago, were broken during the month of September when orders for 2084 motor trucks were received. This was the largest sales figure for the month by 35 per cent in the history of the company.

Sherwin-Williams Promotes Three

Sherwin-Williams Co. has relieved H. D. Whittlesey of his duties as director of sales to devote his entire time to executive duties. A. W. Steudel has been promoted to general manager of the company and K. H. Wood becomes director of sales and distribution.

Reo Engine Exchange Plan

Under a new service plan, Reo Motor Car Co. will re-manufacture used engines on an exchange basis, replacing old engine parts with new parts where needed and completely re-making the motor. The re-manufactured engine will carry the same guarantee as a new engine. The only condition imposed is that the old engine be returned to Reo without the cylinder block broken and otherwise in such condition that it can be re-manufactured. They tear the engine completely down, rebore the cylinders, and put in new pistons and rings, crankshaft and connecting rod, etc.

New Autocar Districts

The Autocar Co. has split its Southern New England district into two parts. One will be the Rhode Island district with headquarters in Providence and the other will be the Southern New England district with headquarters in New Haven. W. J. Fowler has been made manager of the Rhode Island district. He will supervise branches at Providence, New Bedford and Fall River, Mass. Charles D. Allen has been promoted to the District Managership at New Haven. He will supervise branches in Bridgeport, Hartford, New Haven, Stamford and Waterbury, Conn., and Springfield, Mass.

Hayden Is Mack Chairman

Charles Hayden has been elected chairman of the board of directors of Mack Trucks, Inc. The office was newly created following the death of A. J. Brosseau.

Delco Brake Division Independent

The Delco brake division of General Motors at Dayton, O., will operate independently of Delco Products division with R. H. Ahlers as general manager of the Products division. C. H. Kindl becomes general manager of the brake division.

When It Rains, It Pours

LET IT RAIN... OR SNOW... OR SLEET! DULUX GIVES MORTON TRUCKS A GLEAMING, DURABLE FINISH FOR ALL KINDS OF WEATHER!

HOUSEWIVES everywhere know the necessity of a salt that pours in damp weather. That's why Morton's Salt is such a big favorite.

Truck owners, too, know the money-saving value of a finish that keeps its lustre in spite of year-round exposure to all kinds of weather conditions. And that's the reason Du Pont Automotive DULUX is the finish for Morton trucks.

DULUX has *everything* a truck finish must have—brilliant, gleaming colors, the ability to *keep* its fine appearance in spite of weather, traffic fumes and stains, bumps and knocks, the daily wear and tear of road service. And because of its extraordinary durability, DULUX saves money on overhead. It makes refinishing jobs few and far between.

DULUX will give you the same benefits it gives Morton trucks. It will make your fleet look better for a longer time and definitely lower your overhead.

DULUX is easy to apply. You can spray or brush it on right in your own shop. Or if you don't maintain a refinishing shop, an Authorized DUCO-DULUX Refinisher can do it for you. Ask him for an estimate on finishing your trucks. He'll be glad to give you complete details about this outstanding finish. E. I. du Pont de Nemours & Co., Inc., Finishes Division, Refinish Sales, Wilmington, Delaware.

DU PONT
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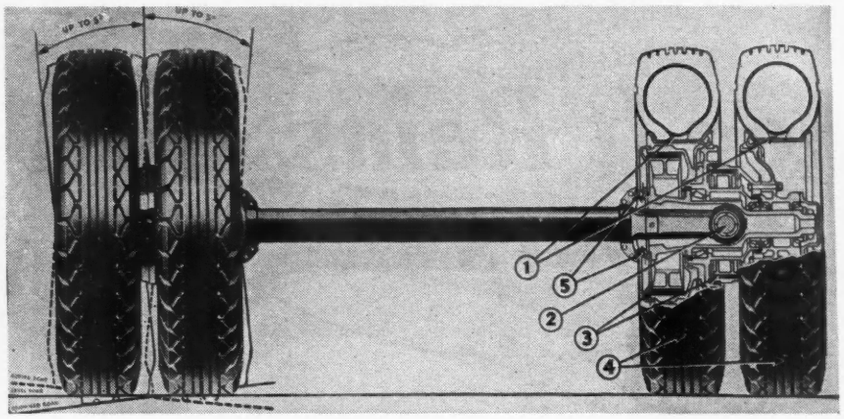
AUTOMOTIVE DULUX
REG. U. S. PAT. OFF.



Compensating Axle for Trailers Adjusts Itself to Road Surfaces

ANNOUNCEMENT has been made of a new development in highway transportation in the form of a Compensating Axle, which gives remarkable economies in tires and fuel, and is now being offered to trailer and semi-trailer operators. This axle is manufactured and sold by the Detroit Compensating Axle Co., Detroit, Mich.

The new axle of 18,000-lb. capacity is so designed as to permit its dual tires to fit any road crown and to automatically adjust itself to variations in the road surfaces. The axle beam has a swivel spindle at each end which carries the bearings and wheels. The swivel is so designed that the wheels may oscillate as much as five degrees in either direction from center. Thus, the camber is automatically adjusted and this tends to distribute the load weight on all tires. Because the wheels have independent rotation, tire drag or scuffing on turns or sharp crowned roads is eliminated. Not only is there considerable saving in tires due to the free rotation of the wheels, but there is considerably less draw-bar pull. Users of experimental axles report fuel savings up to 20 per cent, and tire mileages in excess of 200,000 miles.

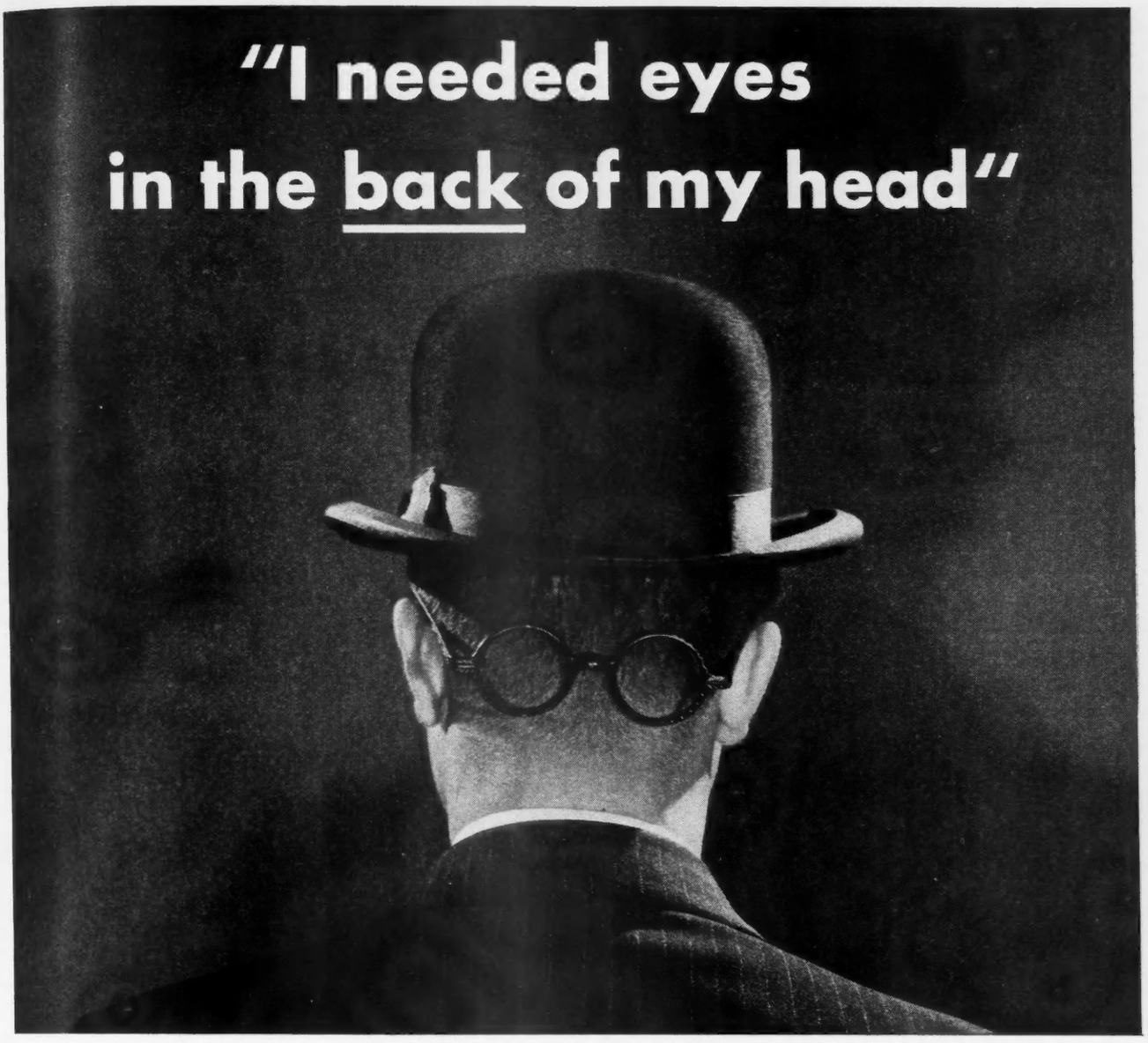
Another unique feature of this axle is its system of braking. Both the inner and outer brakes operate simultaneously and with equal effectiveness up to the skidding moment of the inner tire. When the inner tire is locked, its road grip falls off from 30 per cent to 35 per cent, but skidding is prevented by the continued rotation of the outer tire which only receives 90 per cent braking effort. This is a decided advantage on slippery pavement as the skidding and jack-knifing hazard is reduced to a minimum. The Detroit Compensating Axle is equipped with an electrical warning signal which apprises the driver in the cab the instant one tire goes soft. Twenty-two points of advantage are claimed by the company.

Evidence of its economy is shown in the experience of one user who states that his semi-trailer, equipped with a Detroit Compensating Axle, had travelled approximately 200,000 miles on the original tires, which were still good for at least 25,000 miles more of service, and in the meantime he saves one gallon of gasoline for every twenty miles of travel with his semi, hauling a 12-ton load.

New Truck Registrations by Makes by Months

	Autocar	Brockway	Chevrolet	Diamond T	Dodge	Federal	Ford	G. M. C.	International	Mack	Reo	Sterling	Stewart	Studebaker	White-Indiana	Miscellaneous	Total
January....1936	75	94	15,124	495	6,207	223	14,606	428	4,743	90	339	8	85	143	493	607	43,760
January....1935	71	86	9,867	550	5,141	152	13,260	858	3,513	114	380	10	42	127	308	280	34,759
February....1936	57	88	14,978	510	5,556	170	12,226	758	4,365	107	217	4	62	134	408	661	40,301
February....1935	41	54	11,701	499	3,271	113	14,330	570	3,174	63	292	10	34	107	217	321	34,797
March....1936	88	127	19,511	634	6,753	205	16,168	1,551	5,395	184	264	17	73	221	477	762	52,430
March....1935	56	67	13,744	534	4,284	132	16,805	850	3,673	100	389	14	60	135	258	410	41,511
April....1936	121	179	23,323	784	8,818	271	18,493	2,733	7,308	289	379	21	112	327	700	1,099	64,957
April....1935	79	109	15,024	568	5,708	177	17,943	870	4,554	159	449	31	62	189	309	554	46,785
May....1936	109	168	21,443	754	8,507	275	17,971	3,045	6,704	440	399	16	116	358	719	1,159	62,183
May....1935	78	97	16,284	570	5,381	193	17,591	883	4,807	189	616	5	60	229	294	691	47,968
June....1936	96	137	19,045	660	7,777	287	16,930	2,820	6,151	427	325	28	113	320	599	1,136	56,851
June....1935	73	113	17,576	572	4,911	178	17,385	901	4,710	103	439	16	69	218	258	721	48,243
July....1936	137	207	21,553	846	8,153	280	18,639	3,501	7,167	492	382	22	132	361	748	1,075	63,695
July....1935	99	114	18,608	593	5,336	202	18,073	857	5,308	147	439	19	85	219	336	808	51,243
August....1936	139	163	20,931	801	8,298	251	16,426	3,070	6,314	434	322	39	126	320	635	953	59,222
August....1935	91	143	18,554	591	5,723	219	16,429	1,312	5,231	145	476	9	94	264	354	720	50,355
Eight Months....1936	822	1,163	155,908	5,484	60,069	1,962	131,659	17,906	48,147	2,463	2,627	155	819	2,184	4,779	7,452	443,399
Eight Months....1935	588	783	121,358	4,477	39,755	1,366	131,816	7,101	34,970	1,020	3,480	114	506	1,488	2,334	4,505	355,661
% Change 8 Months....	+40	+49	+28	+22	+51	+44	−	+152	+38	+141	−25	+36	+62	+47	+105	+65	+25

"I needed eyes in the back of my head"



"I WAS like a man who bends over to pick up a pin in the street—only to get bumped by a truck.

"Except I got bumped by a whole fleet of trucks, *my* fleet.

"To save a few cents a gallon, I slapped *cheap oil* in the crankcases of my trucks... and thought I was saving money.

"Well, for every nickel I saved, I shelled out double. Carbon camped on my pistons like barnacles on a derelict ship. Sludge strangled my motors. The oil itself became thin as watered milk.

"When overhaul costs started piling in, I wished I'd had eyes in the *back* as well as the front of my head . . . and paid a few cents more for a better oil.

"I certainly cocked up my ears and listened when the Gulflube salesman came in. His story sold me, and I've been using Gulflube ever since. My maintenance costs have gone down and DOWN. I'm ready to climb right up on a soap box, and tell you how

"Gulflube can do the same for you!"

Gulflube is the best premium quality oil selling at non-premium prices. Gulf's exclusive Multi-sol process washes it clean of carbon, gum and sludge forming compounds. Gulflube thins out less under heat, flows freely at zero temperatures, and has remarkably high film strength.

It not only treats a motor better. It is consumed more slowly. And its high mileage has recently been stepped up another 20 or 25%! Get the complete money-saving story. Mail the coupon.

GULFLUBE MOTOR OIL

GULF

HERE'S AN OFFER THAT MEANS BIG MONEY TO YOU!

CCJ-116

GULF, 3800 Gulf Bldg., Pittsburgh, Pa.

Gentlemen:

I should like to get the complete money-saving story on Gulflube.

Name_____

Address_____

City_____ State_____

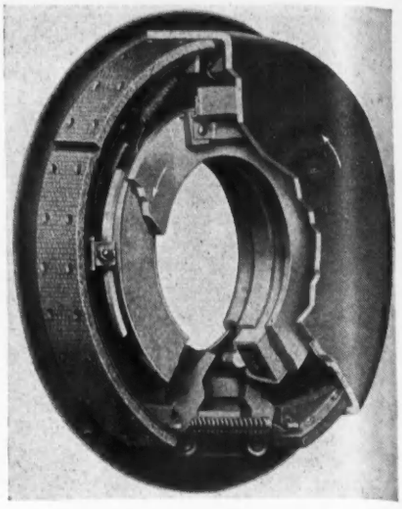
New Warner Electric Power Brake

THE Warner Electric Brake Mfg. Co., Beloit, Wis., has announced development of a new electric power brake for coach and commercial trailers.

The brake, operating on as little current from the storage battery as a tail light, involves several new principles. From a trailer standpoint one of the chief advantages is that only one electric wire is needed as connection between the power car and the trailer.

The brake is operated on the brake drum by an electro magnet which, when current is applied, clings to a disc which revolves with the wheel. The revolving motion of the wheel is thus transferred to a cam lever which expands the brake band against the drum in the conventional way.

From a mechanical standpoint, the brake construction is simple. No complicated maze of wiring is required, but just a single wire leading to each wheel. The electro-magnetic clutch

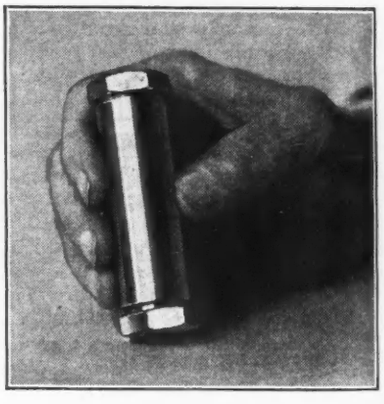


which is built into the brake transfers power from one part of the wheel to the other.

Brake Safety Valve

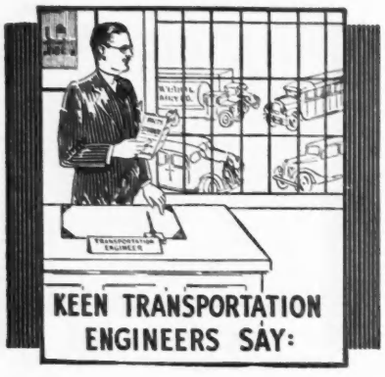
ATTACHING the "Vickers hydraulic brake safety valve" to the fluid lines running to front and rear wheels increases the safety factor 50 per cent, the Vickers Mfg. Co., Buffalo, claims.

This valve is of the unbalanced piston type closing from pressure on one side, and lack of pressure on the other side. If installed in the front wheel line, and either front wheel cylinder leaked badly, or the line ruptured, the valve would instantly close and leave the vehicle with brakes on the rear wheels which may be operated with the foot pedal. If another valve was installed in the rear wheel line, and either rear wheel leaked badly or fluid line broke, the valve would close, and



the braking thrown to the front wheels. On semi-trailers one valve only is used that would throw the braking effort to rear wheels.

The above illustration is designed for 1500 lb. working pressure per square inch, and may be used on high pressure lines of ¼ and 5/16 in. List price is $3.50 each.



The RIGHT
"EP" Gear Lubricant
INSTALLED IN
Two-Speed Truck Axles
Insures Lower Maintenance Cost

INSIST UPON—AND GET—GENUINE
"STURACO" EXTREME PRESSURE ("E.P.") GEAR AND CHASSIS LUBRICANTS

"STURACO" is approved by leading builders of "special" axles. Properly installed and serviced, its use will save you money.

"STURACO"—with five years of actual road service behind it—is today considered by leading impartial lubrication authorities as a genuine engineering achievement.

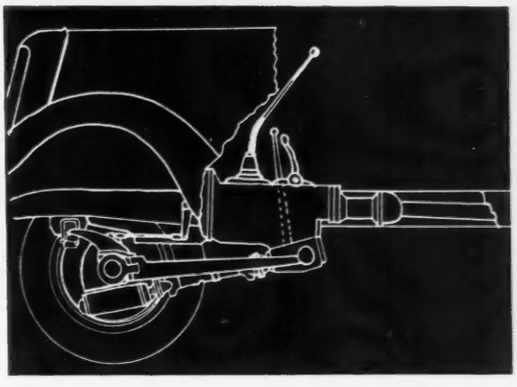
Why delay further in ordering trial drum? Act today.

"STURACO" E. P. LUBRICANTS
ARE THE ORIGINAL DEVELOPMENT OF
D.A. STUART & CO.
ESTABLISHED 1865
GENERAL OFFICES 2727-2753 SO. TROY ST. CHICAGO, U.S.A.
BRANCHES IN PRINCIPAL CITIES

THE BIG THREE
OF MODERN LUBRICATION

4 HOURS

And . . . . **Your difficult and expensive hauls become easy and low-cost hauls with the new 1937 ALCO 4-Wheel Drive Unit.**



WHAT IT IS

The new 1937 Alco 4-wheel drive unit is the industry's first one-piece transmission assembly which drives both front and rear axles, and a front driving axle which can be applied to standard Ford or Chevrolet trucks—new or old—in 4 hours' time. Cab operated creeper gives 8 forward speeds. De-clutching lever in cab permits optional use of front drive while in motion at any speed.

WHAT IT DOES

Equip your Chevrolet or Ford truck with an Alco 4-wheel Drive and you will decrease the cost per ton mile of hauling—carry heavier loads faster over flat country — climb hills with heavy loads with ease—handle loads in off-the-pavement service and in snow which are practically impossible with rear drive alone—pull a trailer if desired—greatly increase the normal load—greatly reduce the drag of a heavy load on the engine—give the truck faster pickup and prolong the life of your truck.

Write for complete information

ALMA MOTOR COMPANY

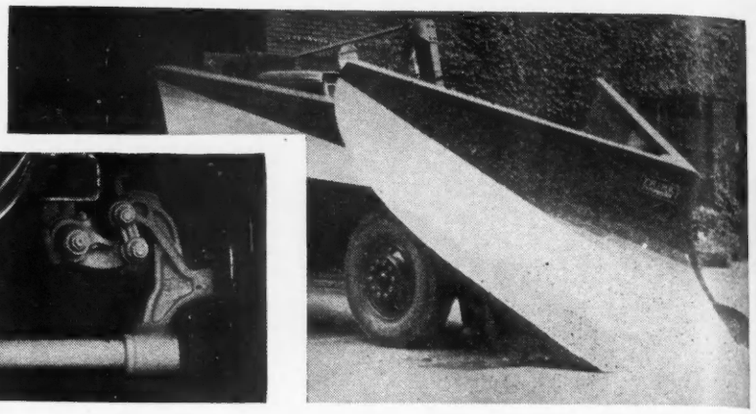
Factory at ALMA, MICHIGAN

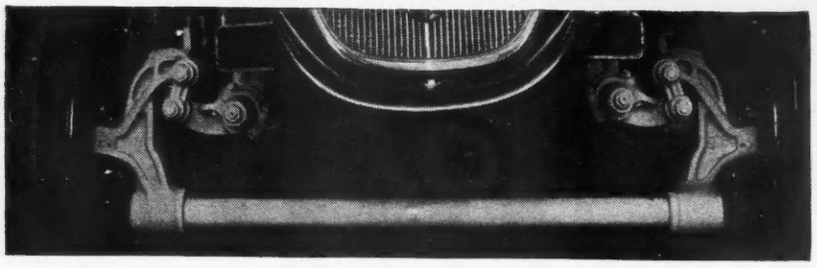
General Offices
Penobscot Bldg., Detroit

Deliveries on this unit will not be made on general inquiry before January because of prior orders.

Right—Frink V-type snow plow interchangeable with the one-way plow

Below — Truck Equipment's front-end gravity spring suspension





FLEET operators who give AMCO a trial immediately rate it AAA-1 on performance. As the test progresses and AMCO breaks old mileage records, its economy can be shared by every unit in the fleet, for it is offered in precisely correct frictions for passenger cars, light deliveries and heavy duty equipment. Evidence, engineering advice or price information is yours for the asking.

BLOCKS
SHOES
ROLL LINING
SEGMENTS

Amco BRAKE LINING

FOR TRUCKS
BUSES
TRAILERS
AND CARS

ASBESTOS MANUFACTURING CO., HUNTINGTON, INDIANA

Gravity Spring Suspension

The Truck Equipment Co., Buffalo, N. Y., has a front end spring suspension which uses the torsion rod instead of coil or leaf springs. This type of suspension eliminates the necessity of stiff springs to carry the load which ride badly when the vehicle is running light. The spring ability of the torsion rod is constant and the changing of the load changes the position of the shackles thus changing the leverage so that the ride is the same light or heavy. The spring is obtained by twisting a rod which is keyed into the shackle at the front and is anchored under the frame side rail at the rear.

Frink Snow Plow

FRINK one-way snow plows, interchangeable with the standard Frink V type plow are designed to fit trucks of 1½ to 8 tons, using the same attachments. This plow is recommended where snow falls are not sufficiently heavy to require heavier equipment. Length of the cutting edge ranges from 8 ft. 8 in. to 11 ft. 4 in. It is beveled on both edges and is reversible to provide double wear. The camming action of the shock absorbing drive link raises and carries back the moldboard.

The special V-type plows have such features as self-ballasting, no side thrust, easy push, they bevel side banks, will not wedge, have little unsprung weight, have interchangeable nose ice plate, may be adjusted without tools, may be quickly attached and detached and are light in weight but rugged.

The model 117S is for trucks of 1½-2 ton capacity and is used for light plowing and patrol work. Model 118S is for 2-3½ ton trucks for medium plowing and patrol work and is the same as Model 117S except that it is one foot wider at the cutting edge to provide a clear path for heavy trucks with dual wheels. Heavier models are the 158S for 3½-5 ,ton trucks and Model 168S for 5 to 10 ton trucks. Leveling wings are suitable with these plows.

GOOD DRIVERS

+

HEALTHY FLEETS

=

SUB-NORMAL COST-PER-MILE

GOOD DRIVERS are assets to any fleet. But perfect drivers alone won't keep operating expenses low.

When cost-per-mile runs high for no apparent reason, it's 16 to 1 that your fleet will profit by Standard Automotive Engineering Service—a free service, incidentally—and use of Standard Oil Products.

Here's why—in any gasoline engine there are 16 vital spots that control operating economy. Let one or more of them get out of kilter and costs start climbing. A Standard Automotive Engineer will check these vital spots for you, make possible adjustments, and tell you exactly what further corrections should be made to bring your fleet back to maximum efficiency.

That's the start of the service you can get from Standard. Then, there are the products themselves—a complete line, each lubricant or fuel specifically developed to give you the most for your money, regardless of price. There's the uniformity of those products, and their availability on every highway in the Middlewest. There are the coupon books, good wherever Standard Oil (Indiana) products are sold.

Standard knows that good products and good service make steady customers. Make a test of the economy of this service by calling your nearest Standard Oil (Indiana) office. A check-up of two or three units of your fleet involves no obligation. Make this test today.

STANDARD OIL COMPANY (*INDIANA*)
910 SOUTH MICHIGAN AVENUE • CHICAGO, ILL.

STANDARD OIL PRODUCTS: ISO-VIS "D" • Standard Transmission Oil (Summer and Winter Grades) • Standard Heavy Duty Gear Grease Standard Wheel Bearing Grease (Medium and Heavy) • Standard Fibre Grease (for Universals) • Standard Pressure Gun Grease (Medium and Heavy) • Standard Water Pump Grease.

Copr. 1936 Standard Oil Co

STANDARD OIL COMPANY (INDIANA)

AUTOMOTIVE ENGINEERING SERVICE

LOWERS MILEAGE COSTS

Metro Truck Conversion

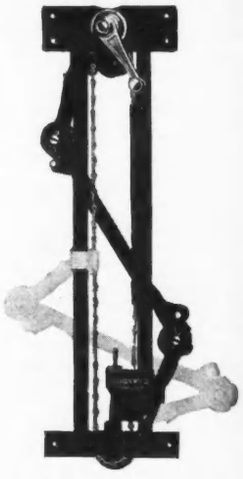
THE Metropolitan Body Co., Bridgeport, Conn., has announced a special body known as the Metro Truck Conversion which converts any standard make of light-duty ½-ton or ¾-ton chassis into a door-to-door delivery unit. The photograph at rigth shows the Metro conversion on a Chevrolet ½-ton commercial chassis.

The body has no overhang. No alteration is required in the driveshaft, engine, transmission or rear axle. The body construction is composite, the entire exterior being metal-covered. The roof is of ply aluminum. Side doors slide, that being true also of the door in the partition behind the driver's seat. Single or double rear doors are optional. The engine is covered with an insulated housing that is easily removed.

Overall length from bumper to bumper is approximately 185 in. Inside payload dimensions are 102 in. long by 68 in. wide by 62 in. high. Total weight of chassis and body is said to be about 1000 lb. less than the average 1½-ton chassis and body.

Window Regulator

A BALANCED-LIFT type regulator is announced by the A. L. Hansen Mfg. Co., 5047 Ravenswood Ave., Chicago. It embodies the balanced-lift principle. Two coil springs constantly equalize tension, whether window is lowered or lifted, giving the same support to the window at all points of travel. The coil steel springs and counterbalancing arms are combined in the straight-up lift type window regulator. It is made in six lengths, with lifts ranging from 14 to 26 in.



Fuel Economizer

THE Champion Anti-Rattler Co., St. Louis, Mo., has announced a carburetor conversion unit for Ford V-8's. It consists of two jets, two compensating bushings and a vacuum brake spring. It is designed to give better carburetion, and a 20 per cent fuel economy is claimed. To install remove carburetor, tap bushings into manifold riser opening, replace jets with special jets and replace standard spring with special spring. Price $.75.

Let 'er blow!

King Winter holds no terrors for a motor equipped with CORDS RINGS

CORDS RINGS will move your fleet on time at less cost

Strange, isn't it how just a piston ring can cut down winter motor failures to a minimum . . . but listen to this:

Long, grinding starts are tough on a battery. **Cords** equipped motors get full compression at the first quarter turn. *They start much quicker* than motors with ordinary rings . . . *save many battery failures.*

Cords Rings do not drain like an ordinary ring. Instead, they actually *attract* and *hold* oil, stopping excessive wall wear.

You know what happens to ordinary rings and cylinder walls when a cold engine starts in freezing temperatures . . . *not so with* **Cords** *equipped motors!* By attracting and holding a generous quantity of oil, *a* **Cords** *Ring is ready for that devastating first few moments!* Oil forced onto the cylinder walls at the initial piston stroke provides metal-saving lubrication when most needed and hardest to get!

Every **Cords** installation will save you thousands of miles of needless motor wear this winter. If you're skeptical, make a test! Call your **Cords** representative or write San Diego address below for millions of miles of proof!

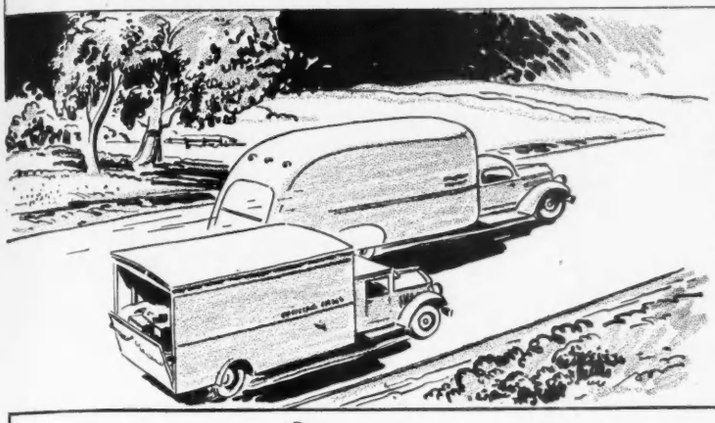
GET THE *Original* CUPPED SEGMENT RING

CORDS RINGS

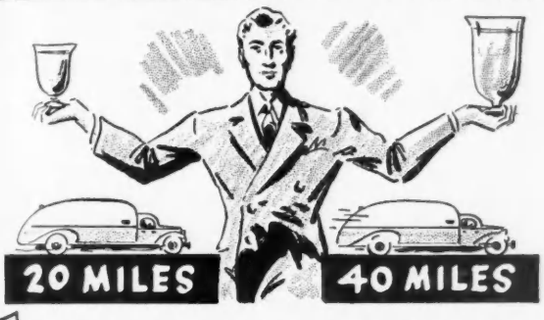
CORDS Piston Ring Mfg. Co. • Box 922 San Diego, California

Factories also at Grand Island, Nebraska and Victoria, British Columbia

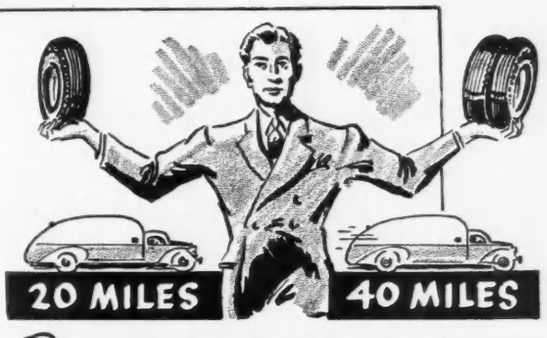
FACTS ABOUT TIRES THAT SHOULD INTEREST EVERY OPERATOR of TRUCKS!



A 1930 MODEL TRUCK WOULD ORDINARILY OPERATE BETWEEN 25-30 M.P.H. IN INTER-CITY SERVICE. A 1936 TRUCK GOES FROM 40 TO 45 M.P.H. IN INTER-CITY SERVICE AND AT TIMES EVEN FASTER....

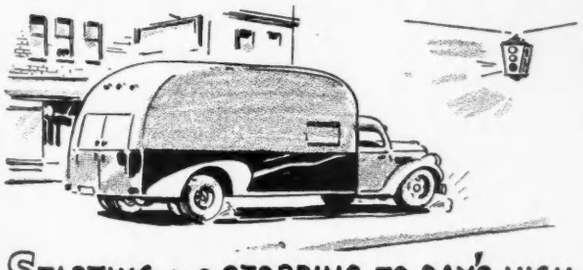


EVERYONE KNOWS IT TAKES TWICE AS MUCH GAS TO GO TWICE AS FAST —



BUT FEW CONSIDER IT TAKES ABOUT TWICE AS MUCH TIRE TO GO TWICE AS FAST..

A TRUCK GOING 40 IS ROUGHLY, 4 TIMES AS HARD TO STOP AS ONE GOING 20!



STARTING AND STOPPING TO-DAY'S HIGH SPEED TRUCKS IS ACCOMPANIED BY A MARKED INCREASE IN THE RATE OF TIRE TREAD WEAR!

OPERATORS WHO HAVE GOTTEN BY WITH POORER QUALITY TIRES ON OLDER MODEL TRUCKS WILL FACE EXTREMELY HIGH TIRE COSTS ON MODERN TRUCKS UNLESS THEY BUY TIRES MADE OF THE FINEST FABRIC OBTAINABLE AND THE TOUGHEST RUBBER EVEN THOUGH THEY MAY HAVE A HIGHER INITIAL COST . . . . . .

GENERAL TRUCK TIRES COST LESS

THEY ARE STRONGER . . . *TWO ADDITIONAL FULL WIDTH PLIES OF FABRIC GIVE GENERALS MORE STRENGTH THAN ANY OTHER TRUCK TIRE.*

THEY ARE COOLER . . . *GENERALS ARE STRONGER, THERE IS MUCH LESS GIVE AND PLAY . . . THEREFORE LESS FRICTION-GENERATED HEAT TO DANGEROUSLY WEAKEN THE FABRIC.*

THEY HAVE MORE COMPACT TREADS . . . *GENERAL'S TREADS ARE HELD FIRM AND COMPACT BY THE STRONGER BODY.. "TREAD GROWTH" IS PREVENTED.. "FATIGUE STRETCH" IS REDUCED. THAT'S WHY GENERALS PRODUCE MORE MILES AT LESS COST.*

GENERAL TRUCK TIRES

News SUMMARY

Insurance Regulation Waived

Rule 8 of the insurance regulations of the Motor Carrier Act has been temporarily waived by the I.C.C. for one year on policies in force Oct. 1. This rule decrees that policies covering personal, property or cargo liability can only be written by states legally authorized to do business in the states in which the truck travels.

2000 Truckmen Discuss Problems at ATA Meeting; Rodgers Reelected

By GEORGE APPLEGREN

American Trucking Associations, Inc., at its third annual convention in Chicago last month, considered the four matters which are paramount in the industry today—taxation, the experience of the last seven months under Interstate Commerce Commission jurisdiction, the attitude of shippers toward the industry, and the problems peculiar to the eight major classifications of operators.

The convention was the best attended in the association's history, with nearly 2000 truckmen from every state attending some of the meetings.

A large part of the convention was given over to group meetings. These adopted formal resolutions unanimously opposing the plan for store-door pickup and delivery which Class 1 railroads have before the commerce body.

From the furniture movers meeting came a resolution urging the Interstate Commerce Commission to establish a rate for interstate movement on the hundred-pound weight basis and to revoke the present rates that are based on the cubical contents schedule. It was pointed out that this is the only instance where freight of any class is moved on a basis other than the load weight.

The automobile haulers, intra-state and interstate, and the private carriers gave much of their time to consideration of the lowering of weight limits which some states are putting into effect. These conferences favored uniform weight legislation.

After giving but brief attention to their present rates, the Rates and Tariffs Bureau took up the matter of leveling the discrepancies which exist on inter-territory shipments. They considered, also, the mileage limits over which their operations can be handled at profit.

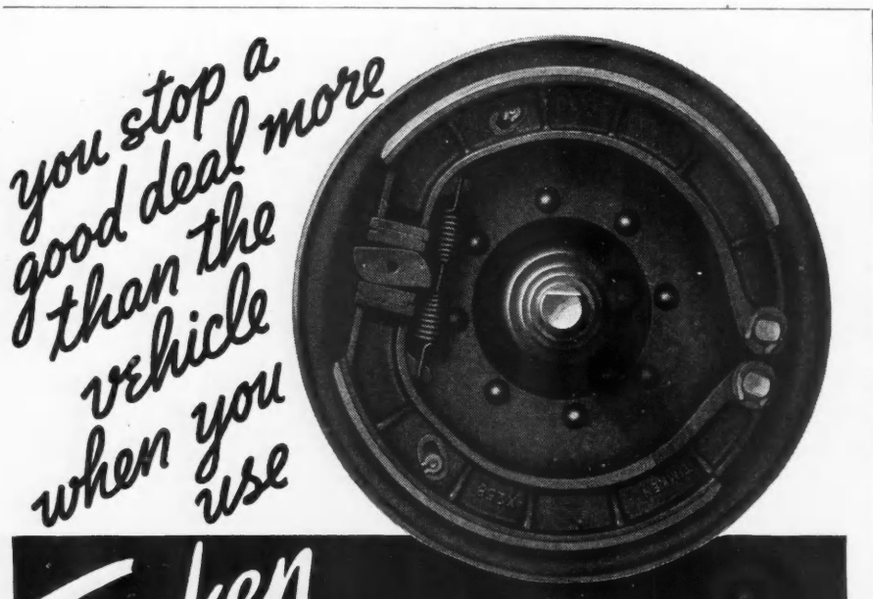
Addressing the opening session, Commissioner William E. Lee, of the I. C. C., stated emphatically that the commission has not sent any G-men into the field to spy on the industry. He said that instead of playing the part of snoopers or "back-seat drivers," it was the commission's desire to be helpful and constructive. He assured his hearers that it would not be long until the commission was ready to "crack down heavily" on cheaters, chiselers and those guilty of unfair practices.

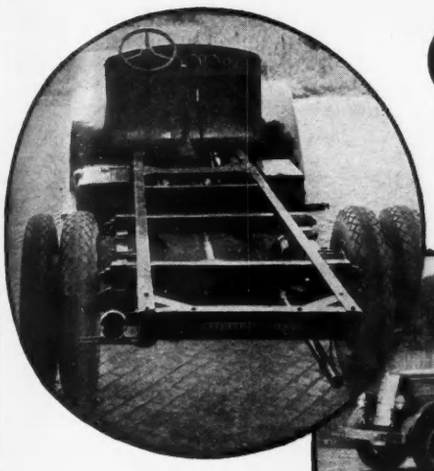
Speaking on the view which shippers hold of the trucking industry, L. E. Muntwyler, traffic manager of Montgomery Ward & Co., and chairman of the traffic section of the National Retail Dry Goods Association, urged operators to immediately place their rates on such level as will assure them a profit. He said that unless they did this they could not perform the quality of service which shippers expected and wanted.

B. H. Markham, director of the American Petroleum Industries committee, spoke on taxation, and said it behooved the trucking industry to attach this growing evil in a united manner.

The report of Treasurer John F. Winchester revealed that the association was carrying a $70,000 deficit, which, he said, was due largely to the extremely vast amount of work it has been called on to do in the past year in connection with legal fees to prosecute and defend so-called "test" suits, publishing of rates and

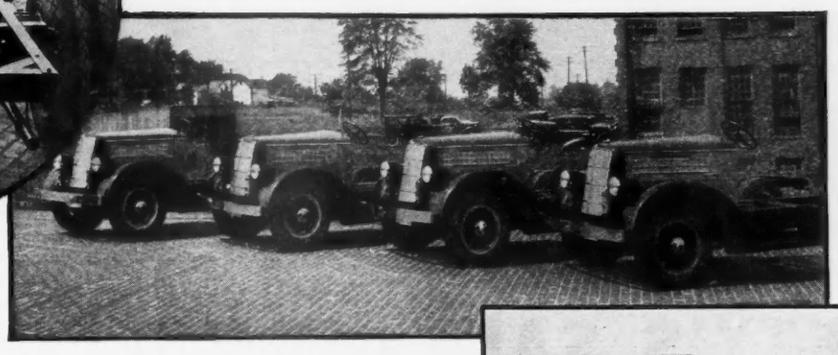
(Turn to Page 80, Please)

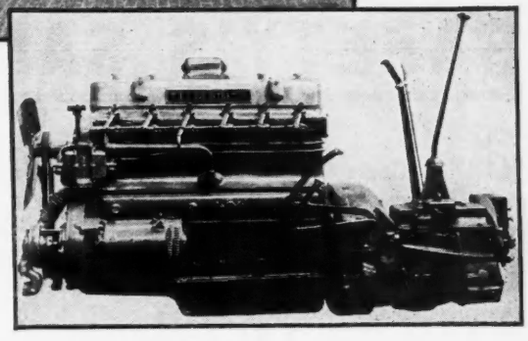

you stop a good deal more than the vehicle when you use
Timken "T" SERIES BRAKE
for trailers
you stop needless expense in brake service and maintenance
you stop all uncertainty as to brake performance on the road
you stop rattles and other evidence of needless wear
you stop the rusting and weakening of vital brake parts
and... quickly, efficiently... you STOP
the world's largest axle builder
THE TIMKEN-DETROIT AXLE COMPANY
TIMKEN AXLES
Detroit, Michigan



CLYDESDALE

DIESEL ENGINE MOTOR TRUCKS





CLYDESDALES *are Not conventional trucks with Diesel motors added... they are Designed and Built as Diesel Trucks Throughout...*

CLYDESDALES are carefully engineered — properly balanced — thoroughly tested Greater "reserve capacity" is provided in clutches, transmissions, propeller shafts, rear axles, and other parts of the chassis to meet the requirements of Diesel Engine Power. And Clydesdale engineers have been guided by the trend toward better looking trucks—for the Clydesdales are beautifully streamlined . . . . . .

The present series of Clydesdale Diesel Engine trucks include models from 1½ to 12 tons capacity. We invite fleet operators to investigate immediately the profit-making possibilities of our line, which today is setting new standards of performance and sales in the truck transportation field. Territories are now being allocated to responsible, aggressive sales organizations. Write for detailed literature.

CLYDESDALE

MOTOR TRUCK COMPANY

Factory: **Clyde, Ohio, U.S.A.** ***Cable Address:*** **Clydesdale**

All Sizes and Capacities . . . Special Trucks for Every Purpose

(CONTINUED FROM PAGE 78)

other matters. At a meeting of heads of state associations, a move was started to wipe out this deficit by subscription, which resulted in $35,000 being pledged, the largest pledge coming from New England which was $5000.

In the resolutions that were adopted the association placed itself on record as opposed to the Social Security Act, terming it an unjust tax and declaring that it tended to reduce employment and raise the costs of operation.

A resolution by the dump truck operators declared that the government through the CCC and other agencies is competing with truckmen.

Another resolution, presented by local cartage operators, urged the I.C.C. to set up a separate classification in the Motor Carrier division for their operations.

Louisville will get the 1937 convention and the following officers were elected:

Ted V. Rodgers, Scranton, Pa., reelected president for the fourth year; secretary, Chester G. Moore, Chicago; treasurer, Louis A. Raulerson, Jacksonville, Fla.; first vice-president, H. D. Norton, Charlotte, N. C.; second vice-president, Griswold B. Holman, Jersey City, N. J.; third vice-president, Clinton S. Reynolds, Tacoma, Wash.; fourth vice-president, Fisher G. Dorsey, Houston, Texas.

District vice-presidents: first district, M. B. Emerson, Vermont; second district, Griswold B. Holman, New Jersey; third district, W. H. Brearley, Pennsylvania; fourth district; H. D. Norton, North Carolina; fifth district, Lewis J. Benton, Kentucky; sixth district, James B. Godfrey, Jr., Michigan; seventh, Fisher G. Dorsey, Texas; eighth, John W. Blood, Kansas; ninth, Joseph E. Edell, North Dakota; tenth, J. F. Rowan, Colorado; eleventh, Clinton S. Reynolds, Washington; and twelfth, Al Meyers, California.

Divisional vice-presidents (group chairmen, who automatically become association vice-presidents): Interstate, Evans A. Nash, Oklahoma City, Okla.; automobile haulers, W. F. Carey, Detroit; dump truck, Frank Flanagan, West Rocksbury, Mass.; oil field haulers, B. H. Megginson, Oklahoma City, Okla.; private carriers, John F. Winchester, Newark, N. J.; cartage operators, Hugh E. Sheridan, New York City; household goods operators, John L. Wilkinson, Charlotte, N. C.; intrastate, Glenn R. Ward, Columbia, Ohio.

NOT FOR LAW BUT FOR SAFETY'S SAKE--PLUS

FLEET Operators who appreciate the value of public good-will know that they can win it or lose it as their trucks travel the highways.

Good looking, well kept vehicles, with adequate lighting and safety devices that aid and protect motorists and pedestrians, are good advertising. They attract attention and favorable comment from countless thousands of critics in every walk of life. They build prestige for owners or operators that results in new customers and increased operating income.

1

2

DIETZ

PILOT DIRECTION SIGNAL

Illustrations

1 Standard Lite
2 Two-Way Lite
3 Flush Mount Lite

3

QUALITY and SAFETY in Motor Accessories are Siamese Twins—inseparable. You get this quality that makes for Safety in Dietz Approved Pilot Direction Signals, featuring four Lites, one at each corner of the vehicle. The lites are operated through a control box mounted on the steering column, with switch accessible to the driver, without taking hands from the wheel. This control box saves on usual installation cost because completely assembled at the factory. The three styles of lites illustrated meet all requirements of trucks, trailers and buses.

•●•

We have recently issued a handsome new Catalog which illustrates the newest types of modern Safety Lites and Signalling Devices for Trucks, Buses and Automobiles. It may interest you to have a copy on file. If so, just ask for it.

R. E. DIETZ COMPANY, NEW YORK

PIONEER MAKERS OF VEHICLE LAMPS, FOUNDED 1840

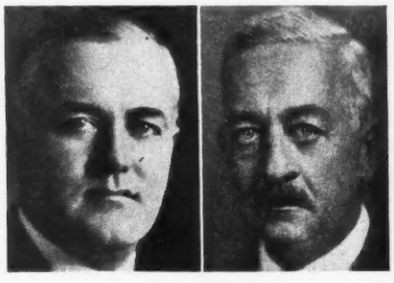
HEAD LIGHTS • TAIL LIGHTS • MARKER LIGHTS • DITCH, FOG & SPOT LIGHTS • DIRECTION SIGNALS
TRUCK FLARES • REAR VISION MIRRORS • FLOOD LIGHTS • CATAPHOTE REFLECTORS • FIRE EXTINGUISHERS

Sales Up 31%; Output Up 41%

New truck registrations for September are estimated at 54,000 units based on returns from 35 states. This is an increase of 31 per cent September, 1935, when 41,390 units were registered. It is, however, a drop of 10 per cent below registrations for August when 59,222 units were sold.

New truck production for September totaled 46,707 units. This is an increase of 41 per cent over September, 1935, when 33,229 units were produced. Production for the first nine months of 1936 totaled 644,046 units compared to 546,353 units produced during the same period in 1935. This is an increase in production of 18 per cent.

Autocar Appointments

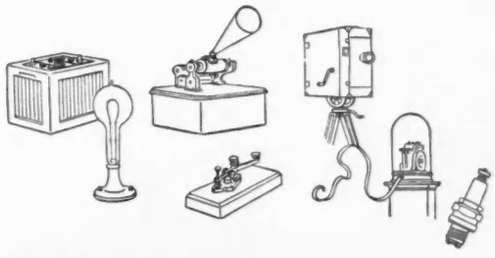


J. A. Donnelly (above left), manager of the Chicago branch of the Autocar Co., was elected vice-president of the Autocar Sales & Service Co. A. H. Bishop (above right), vice-president in charge of the Baltimore branch has been honored for his 16 years as president of the Automobile Trade Association of Maryland. Establishment of a branch of the company in Charlotte, N. C., is going forward with vice-president E. F. Coogan directing activities. A Rochester, N. Y., branch has also been opened, Wm. H. Brown in charge.

Three hundred twenty-two exhibitors will be at the Automotive Service Industries Show in Chicago, Dec. 9-13.

(TURN TO PAGE 150, PLEASE)

YOU'RE LEAVING YOURSELF IN THE DARK... if you don't get the full facts about



Edison SPARK PLUGS

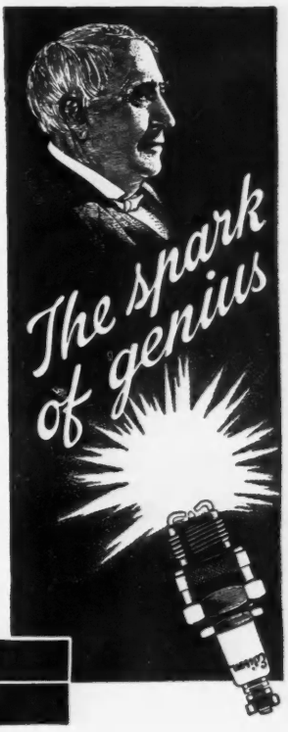
...EDISON...

a name associated with master achievements in the minds of millions

In America's greatest metropolitan centers—in the smallest and most isolated country town—everybody knows the name EDISON. It is respected where thousands of pleasure cars and commercial vehicles stream in endless procession along modern concrete highways. It inspires confidence in "the great open spaces" where cross country trucks and buses take the bumps.

You know the *name!* But—unless you *know the plug* through actual usage you'll never realize why it scores so heavily on a basis of performance and economy in the heavy duty field. One user who was never able to get over three to four thousand miles of service from a set of ordinary plugs got 17,250 miles with a set of "Edisons." Today his entire fleet is equipped with Edison Spark Plugs . . . *and no wonder!*

So—don't "leave yourself in the dark." Get some real light on a subject that concerns your own profitable truck operation—*your own pocketbook!* Write, now, for full facts about the kind of spark plug performance you have been looking for.



EDISON-Splitdorf Corporation · West Orange, N. J.

ONE OF THE Thomas A. Edison INDUSTRIES

Shop Supplies

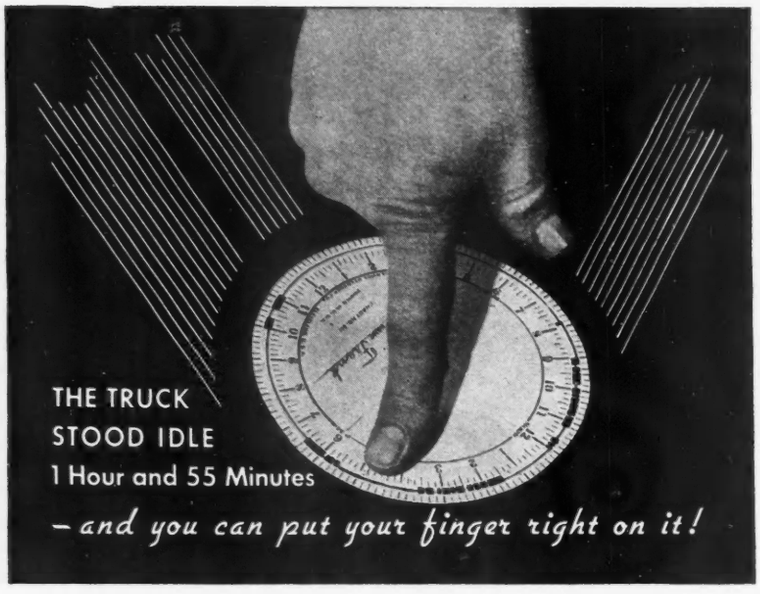
(CONTINUED FROM PAGE 36)

Ignition Insulation

RED INSUL is the name of liquid insulator, a product of the Insul Products Co., 521 Fifth Ave., New York City. When applied to the ignition system, Red Insul waterproofs and reinsulates all high tension current, preventing leakage. Once insulated, the motor will not stall, the manufacturer claims. The insulation is brushed on freely over wires, distributor, generator, etc. It dries in a few minutes and may be applied effectively even during rain. Price: 50 cents.

Clamps for Leaks

CLAMPS for permanently stopping leaks in pipes, regardless of how large or small, whether high or low pressure, are a product of the M. B. Skinner Co., 3504 W. Sample Street, South Bend, Ind. These clamps are available for stopping leaks in air, gas, steam, vapor, gasoline, oil, chemical, pulp, ammonia, brine and all other types of pipe lines, high or low pressure.



CHECK THOSE COSTLY DELAYS

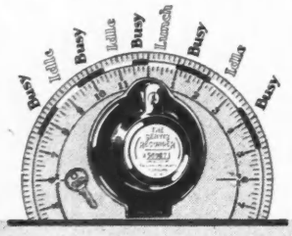
Most trucks *seem* pretty busy, but as a matter of fact they are doing more standing than running. In fact, a motor truck's actual running time averages less than three hours a day . . . Thus, *actual* running time may easily cost you $3.00 or $4.00 per hour, even for a 1½ ton truck!

First Get the Facts

The big problem, of course, in operating trucks is to increase running time. But before you can do this, you have to have a basis to work on; and that basis is best provided by the *Servis Recorder,* with its graphic chart showing daily when the truck was standing and just how long in each case. Then you'll know what to do.

You Can Save Big Money

Perhaps you cannot cut down all of the delays, but the chances are you can cut down some of them; and even with a medium sized truck you only have to increase the actual running time 15 or 20 minutes a day to save $300 or $400 a year! It's big money and it's worth saving. If you don't save it, who else will?



Over 100,000 *Servis Recorders* now in use. Write for booklet–*"Ten Ways of Getting More Work Out of Motor Trucks."* THE SERVICE RECORDER CO., 1422 Euclid Ave., Cleveland, Ohio.

The Servis Recorder
Tells Every Move Your Truck Makes

Foam for Fire Fighting

A MECHANICAL rather than chemical method of making foam for fighting flammable liquid fires and suitable for use with long or short lines of ¾ in. to 2½ in. hose has been announced by the Pyrene Mfg. Co., Newark, N. J. A water stream is converted into a continuous foam stream by coupling a nozzle, known as the Phomaire Play Pipe, to a water line supplying 75 lb. or more pressure at the play pipe. As the water passes through the play pipe, Phomaide—a new foam-making solution carried by the operator in a hip pack, and air are automatically drawn into the water stream in the proper proportions to form foam.

Alumaweld Flux

OF interest to solder and flux users everywhere is the new flux developed by the Alumaweld Co. of America, 2442 South Park Way, Chicago. Alumaweld solder and flux is applied with an ordinary soldering iron or blow torch. The soldering job is done at a low temperature. It works equally well on aluminum, stainless steel, die cast pot metals, cast iron, copper, brass, etc., which makes it easy to join any two different metals if desired. Alumaweld solder has a tensile strength of 12,000 lb.

Seal-Aide

THE Victor Mfg. & Gasket Co., Chicago, now offers its gasket compound, "Seal-Aide" in a two-ounce bottle with a dauber attached to the cork. The price to the dealer is 12 cents. The four ounce, eight ounce and sixteen-ounce cans are still available for the larger users.

Zecol Scum Remover

ZECOL, INC., Milwaukee, Wis., has announced a new product, H. D. Scum Remover. It is claimed that this new product cleans and polishes in one operation, removing heavy road film and oxidation from automobiles. The manufacturer claims that it does not contain harmful abrasives or acid, and is not injurious to lacquers or enamels.

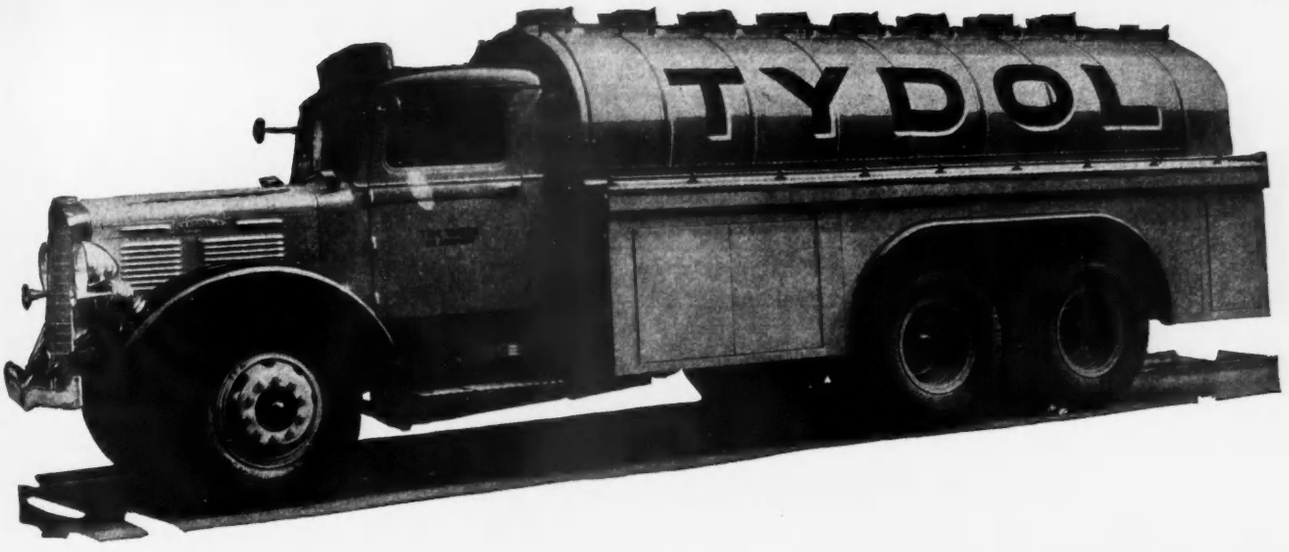
Young Bulletins

BULLETINS Nos. 536 and 636, illustrating products of the Young Radiator Co., Racine, Wis., are available to those interested.

Colloidal Booklet

A BOOKLET on colloidal graphite has been issued by the Acheson Colloids Corp., Port Huron, Mich. It may be obtained by writing to the company.

(TURN TO PAGE 84, PLEASE)



TRUCKTOR PUTS DOUBLED LOADS THROUGH IN WINTER WHEN OTHERS CANNOT MOVE

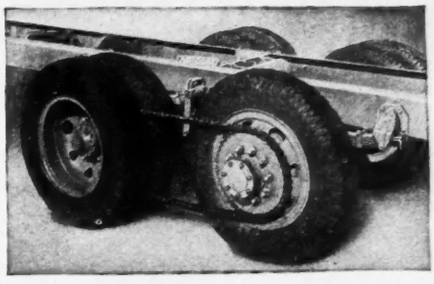
"Laying up for a rainy day" is an expression that sometimes loses its old-time meaning in the trucking business. Laying up a truck because the rainy day has transformed itself into one of icy sleet and snow that stops movement, is an operation that puts no money in the bank.

Trucktor is increasing payload profits and establishing new lows in first costs and operating costs on trucks of every size and make, because of several reasons. Not the least of these is the fact that it keeps trucks rolling during the difficult winter season when bad road conditions often disrupt traffic.

Trucktor furnishes the only practical equipment providing additional traction for hauling when roads are soft and slimy or slippery with ice and snow. Its detachable Chain and Sprocket 4-Wheel Drive supplies the temporary and low cost equipment required—temporary because such aid is seldom needed more than 5% of the time during most of the year. The chain can be installed or removed in a few minutes. This Drive makes skid chains unnecessary.

Any Fleet Manager responsible for getting the utmost loading and income out of his trucks this winter will find it decidedly in his own best interest to investigate Trucktor. Send for Illustrated Circulars and Experience Data on Trucktor and its 4-Wheel Drive in your particular field of trucking.

THE TRUCKTOR CORPORATION
156 WILSON AVE. NEWARK, N. J.



TRUCKTOR DETACHABLE CHAIN AND SPROCKET 4-WHEEL DRIVE FURNISHES ADDITIONAL TRACTION REQUIRED TO KEEP LOADS MOVING DAILY WHEN WINTER CONDITIONS MAKE THE OPERATION OF FIFTH WHEEL SEMI-TRAILERS OR EVEN 4-WHEEL TRUCKS IMPOSSIBLE OR HAZARDOUS. (U. S. Pat. No. 1,862,770)

FROM WAWA DAIRY FARMS, PHILADELPHIA " - - the Chains and Sprockets have done everything you claimed they would do when you sold them to us. These Chains and Sprockets enabled us to go through the worst Winter conditions possible, with more snow and ice than we can remember, without the need of skid chains. We are glad to tell you that we are satisfied with the entire operation of the units sold us, and you are at liberty to refer any prospects to us for our recommendation."

Municipal type trucks like above, equipped with Trucktor and its 4-Wheel Detachable Drive, cannot be stopped by bad road conditions in Winter, and are irresistable pushers behind snow ploughs. This Drive used also by leading oil companies, cross country freighters, in milk transport, etc.

TRUCKTOR

Shop Supplies

(CONTINUED FROM PAGE 82)

Fireproofing Compound

THE perfection of a new fire-resistant cotton duck which, even when exposed directly to fire, will not ignite, is claimed by William E. Hooper & Sons Co., Philadelphia and Baltimore. "Fire Chief," as both the treated fabric and the finish itself are known, differs over other methods of fireproofing fabric in the fact that its fire-resisting properties are impervious to the action of water or the elements.

It is available either as a finished fabric or as a separate finish known as "Hooperwood Fire Chief Compound." The compound is applied, either by brush or spray to any type of cotton duck.

Gatke Brake Block

HI-POWER brake blocks manufactured by the Gatke Corp. of Chicago, are now being sold on a guaranteed mileage basis. These blocks are made in all shapes and sizes for various types of power brakes.

● Prest-O-Lite heavy-duty batteries are built to stand the long hard grinds and sudden demands for which the ordinary battery is wholly inadequate.

For 21 years Prest-O-Lite has been building batteries. Today there's a Prest-O-Lite Battery to fit any job you name—from light delivery work to heavy duty transport.

Remember—the price you pay for a battery is not your most important factor in the cost of battery operation. An untimely battery failure can cost you far more than the original price of the battery.

Ask your Prest-O-Lite Dealer about low-cost battery operation.

PREST-O-LITE BATTERY CO., Inc.
Oakland, Calif. INDIANAPOLIS, IND. Toronto, Can.

Prest-O-Lite

BATTERIES FOR COMMERCIAL CARS

Pen-A-Trate Joint Breaker

PEN-A-TRATE is a fluid which filters quickly into the threads of joints to be broken. Upon coming in contact with the corrosion Pen-A-Trate forms a gas which dissolves the rust into a fine powder and permits the joints to be broken easily.

It is for use on joints, bolts, studs, etc., where corrosion has made removal impossible without breaking. If applied thoroughly Pen-A-Trate will loosen these unyielding joints in two or three minutes.

Brake Wedge Bolts

FLOATING brake wedge bolts, which insure increased positive brake action and at the same time stop chatter, are a new automotive replacement product of The L. F. Kreger Mfg. Co., 550 West 35th Street, Chicago. They equalize the brake action of the front brake shoes. No. 207 is for passenger cars, while No. 208 takes care of the requirements of Ford trucks.

Karpex Cushions

KARPEX seat cushions, a product of the Karpex Mfg. Co., Indianapolis, are designed with air vents and channels to provide ventilation to keep the seat cool and their construction employs the principle of suspending the body weight instead of supporting it thus giving added comfort. Cushions are available to fit any size truck.

Pines Winterfront

PINES custom-bilt metal Winterfront is available for Ford, Chevrolet, Dodge trucks and cars and Plymouth and Oldsmobile cars. It is made of automobile body steel styled and designed to match the vehicle. It can be installed at the curb in less than a minute. Two sliding doors provide for temperature control.

Ero Extinguisher

THE ERO fire extinguisher designed for gasoline and oil fires is a product of the Ero Mfg. Co., 718 W. Monroe St., Chicago. The container is made of heavy gauge brass that resists corrosion and the action of the extinguishing chemical. It is also easy to bring into play.

Gar Wood Bulletins

GAR WOOD Industries, Inc., Detroit, offers bulletin 15 on telescopic hoists, bulletin W-7 on winches and an illustrated bulletin on truck tanks. These have recently been prepared and show the latest in this equipment.

(TURN TO PAGE 87, PLEASE)

Shop Supplies

(CONTINUED FROM PAGE 84)

Serv-A-Lite Outfit

TELEMOTOR CORP. of 260 Fifth Ave., New York, announces its new, deluxe model Serv-A-Lite which is a complete smoking outfit for the motor vehicle. The compact unit consists of an unbreakable case holding 20 cigarettes, a self lighter, and dispenser and a handy ash tray—all in one. Pressing a button delivers a lighted cigarette, ready to smoke. It's fully automatic.

Magnusol Cleaner

MAGNUSOL, a new type of cleaner which makes oils and greases quickly soluble in water, is being marketed by Magnus Chemical Co., Garwood, N. J. Simply dissolved in water, this cleaner may be used safely for cleaning truck bodies, chassis and engines.

Q-Seal(ing) Compound

Q-SEAL joint-sealing compound is used for sealing gasket, metal-to-metal, thread and flanged joints. It is insoluble in oil and gasoline, expands under heat and is not affected by vibration, the manufacturer claims. Quigley Co., 56 W. 46th St., New York.

Power-Oilaide

POWER-OILADE is a colloidal graphite concentrate for adding to the crankcase lubricant and to the gasoline. One ounce is sufficient for 6 gal. of gasoline and 2 oz. for each qt. of lubricating oil. The Hoffman-Kling Co., Milwaukee, Wis., markets the product.

Siloo Stops Freezing

THE Motor Fume Utilizer Corp., Long Island City, N. Y., has developed a crankcase anti-freeze which they have named Winter Siloo. The compound when added to the crankcase lubricant will prevent the freezing of the water which is in the crankcase as a result of condensation. In addition it will tend to prevent the production of harmful acids in the crankcase and it will prevent the formation of sludge.

Speedy Tube Patch

DILLELECTRIC tube repair patches and valve stem replacements offer fleet men advanced tube repair method. The new individual Dillelectric speed patch unit is a ready-cut patch and electric vulcanizer in one with automatic heat and time control. Perfectly heat vulcanized feather-edge repairs, according to the manufacturer, can be conveniently made in just a few minutes. Dill Mfg. Co., Cleveland.

Las-Stik Wood Putty

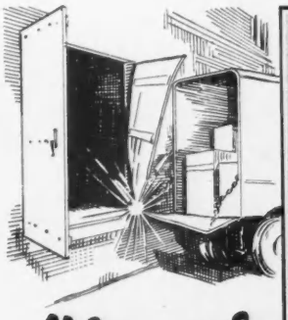
LAS-STIK wood putty repairs anything made of wood. It may be used on trucks for repairing holes in floors, sides, roofs, door locks and hinges. Las-Stik won't shrink, sticks like glue and can be easily cut and drilled. Las-Stik Mfg. Co., Hamilton, Ohio.

Arbor Spacers

THE Laminated Shim Co., Long Island City, N. Y., is now supplying arbor spacers, or shims, in convenient waterproof envelopes, preventing damage and waste in handling. The spacers are packed 10 to an envelope, and are supplied in six sizes and eight different thicknesses, ranging from .001 in. to .020 in.

Megolite Flashlights

INERTIA DEVICES, INC., is now manufacturing and marketing, under the trade mark name Megolite, new flashlights thoroughly insulated against static and dynamic electricity. They are also completely sealed and gasketed against water, gases or vapors.



No Smash-ups with KINNEAR TRUCK DOORS

Convenient . . Out of the way . . more durable

BUILT FOR ANY JOB

Every Kinnear Door is especially built for the individual job — and the Kinnear Truck Door is no exception. Engineers with 40 years specialized door experience work with either you or your body manufacturer. They find out what your needs require and then build a door to suit the type of body. The garbage collection truck illustrated below, on which several cities have standardized, is a good example of the various ways Kinnear Truck Doors can be successfully used. Let us discuss your needs and submit recommendations.

Think of the advantages . . . the economies! An all metal truck door. One that's fireproof and burglar-proof — that rolls UP easily and quickly just like the roll-top on a desk . . . coiling on a small barrel in the top of the truck. Out of the way — free from damage when backing or from wind. And with ability to withstand years of hard treatment — durability that only the strong metal interlocking slat curtain can provide. All of the same efficient features of Kinnear Steel Rolling Doors that have, for so many years, cut door operating and maintenance costs in buildings. That's why Fleet Operators everywhere are adopting Kinnear Truck Doors. They quickly see the economy of Kinnear Door efficiency in their trucks — as well as in their buildings. Write today for further details.

THE KINNEAR MFG. CO.
2100-20 FIELDS AVENUE COLUMBUS, OHIO
Offices and Agents in All Principal Cities

KINNEAR ROLLING DOORS

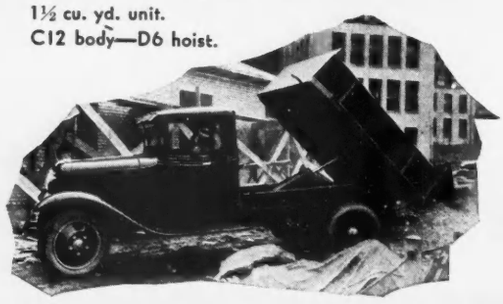
GAR WOOD EQUIPMENT *for* EVERY JOB . .

. . *and* EVERY CHASSIS

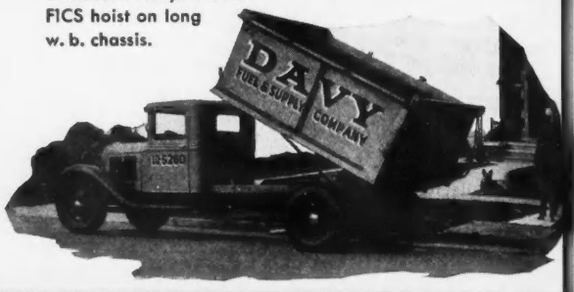
Truck operators everywhere say Gar Wood equipment meets every demand for ruggedness, continuous service and dependability

for LIGHT DUTY TRUCKS

1½ cu. yd. unit. C12 body—D6 hoist.

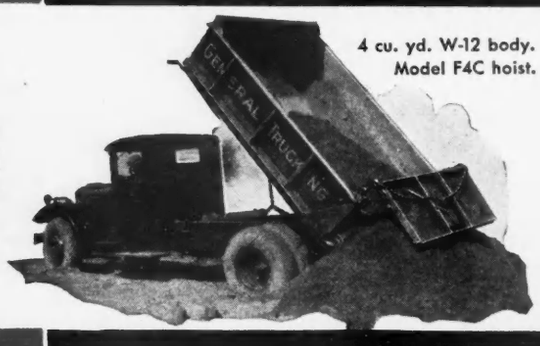


3-ton coke body. Model F1CS hoist on long w. b. chassis.

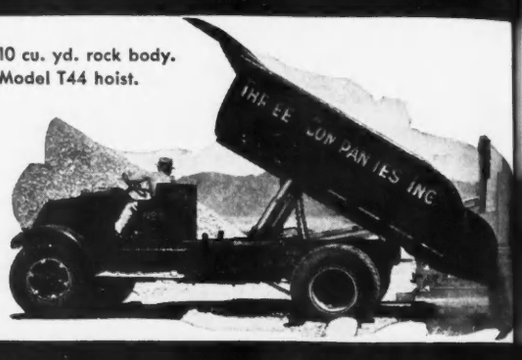


for HEAVY DUTY TRUCKS

4 cu. yd. W-12 body. Model F4C hoist.

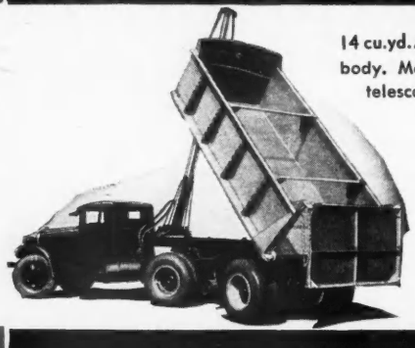


10 cu. yd. rock body. Model T44 hoist.

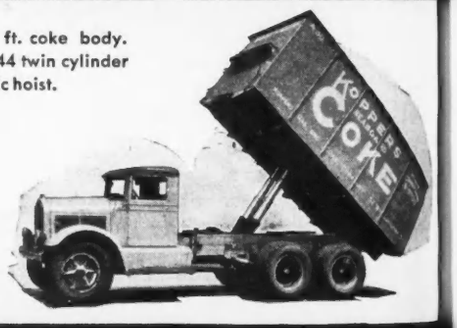


for TRAILERS and SIX WHEELERS

14 cu.yd. Aluminum body. Model TV7X telescopic hoist.

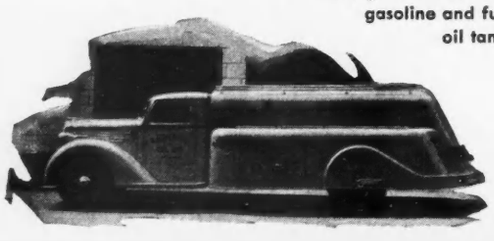


730 cu. ft. coke body. Model T44 twin cylinder telescopic hoist.



also TANKS, WINCHES and CRANES

850 gallon streamline gasoline and fuel oil tank.



Garage tow-in wrecker crane. Capacity 3 tons.

There is a Gar Wood Branch or Distributor near you who will be glad to supply full particulars in connection with your requirements.

GAR WOOD INDUSTRIES, INC.

DETROIT, MICHIGAN

WORLD'S LARGEST MANUFACTURER OF TRUCK EQUIPMENT

Replacement Parts

(CONTINUED FROM PAGE 27)

Grip-Lock Bearing

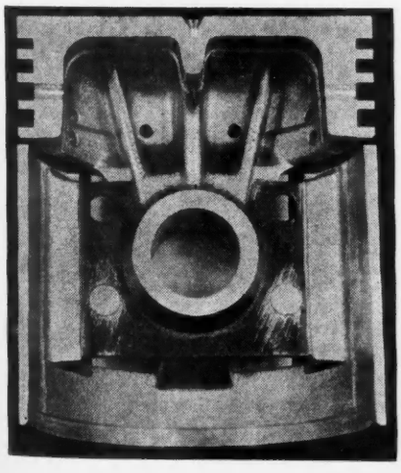
THE SKF grip-lock bearing is the latest addition to the SKF line of anti-friction bearings. Essentially, the bearing is the conventional, self-aligning extended inner race bearing with an eccentric groove machined in the bore of the inner race. Fitted in the eccentric groove is a piece of spring steel known as the grip-lock shoe. When the shoe is in the deepest part of the eccentric groove the bearing may be readily slipped on the shaft. Then, by holding the inner race of the bearing while the shaft turns in the direction of operation, the knurling at the ends of the grip-lock shoe grips the shaft causing the shoe to wedge in the shallow part of the eccentric groove, thus securely locking the bearing on the shaft.

Pins and Pistons

THE Toledo Steel Products Co. has added a line of pistons and chrome-plated pins to its line. The new line is factory duplicate type cast-iron and aluminum-alloy pistons, including the Invar strut type. They are featured in the new Toledo general catalog.

Autothermic Piston

THERMOSTATIC control of expansion is used in the new aluminum alloy piston made by Bohn Aluminum and Brass Corp., and its piston associate A. L. Nelson. The new unit is known as the Nelson Bohnalite piston, Autothermic Type, is standard equipment on a number of cars in current production and will appear on more during the 1937 season.



The new Autothermic piston has steel inserts or plates similar in shape to the invar struts used in a former Nelson design. These inserts are punched and formed from low-carbon steel and set into the mold in such a way that their ends are anchored in the aluminum of the skirt, but not to the piston pin bosses, as the skirt, bosses and head compose a one-piece casting, which relieves the steel inserts of thrust and inertia loads.

In the completed piston these steel strips are paralleled by aluminum over their entire length and these parallel members of steel and aluminum form a thermostatic element from which is derived the name Autothermic. Since the aluminum when heated expands more than the steel, the element will assume a curved form, tending to increase the expansion of the skirt in the direction parallel to the piston-pin and to reduce the expansion along diameters perpendicular to the piston-pin. This effect of the thermostatic elements can be varied by changing the proportions of the cross sections of the steel or the aluminum.

Hoosier Brake Lining

THE Hoosier Brake Lining Corp., North Manchester, Ind., has developed a brake lining that is extremely hard

Leading Fleet Operators depend upon Midland Power Brake equipment to stop heavy loads quickly and safely.

COMPLETE VACUUM KITS

for

Ford, Dodge, Chevrolet, International and G. M. C. TRUCKS and TRACTORS

Midland Vacuum Kits are packed in handy packages, complete with all fittings necessary to make installations.

Midland Vacuum Kits carry full size cylinders and are designed for each chassis. Easily installed. No cutting and fitting is necessary, thus reducing installation labor to a minimum.

Follow the example of leading manufacturers and fleet operators. Equip your present fleet with Midland and be sure to specify Midland Power Brakes on all new equipment.

For complete information on Midland Vacuum Kits and Power Brake equipment, consult your nearest Midland Distributor or write us direct.

- ★ *Never cost more* and generally *less* than other power brake equipment.
- ★ Conform to all state laws.
- ★ Serviced by a nation-wide organization of Midland Distributors.
- ★ Perfectly controlled stops with "Brake Feel."
- ★ Interchangeable in fleet operation.
- ★ Adapted to all types of vehicles.

MIDLAND STEEL PRODUCTS CO.
10605 Madison Ave. Cleveland, Ohio

DISTRIBUTORS WANTED:
Write us about our distributor franchise. Your territory may be available.

MIDLAND (Christensen) *Power Brakes*

Replacement Parts

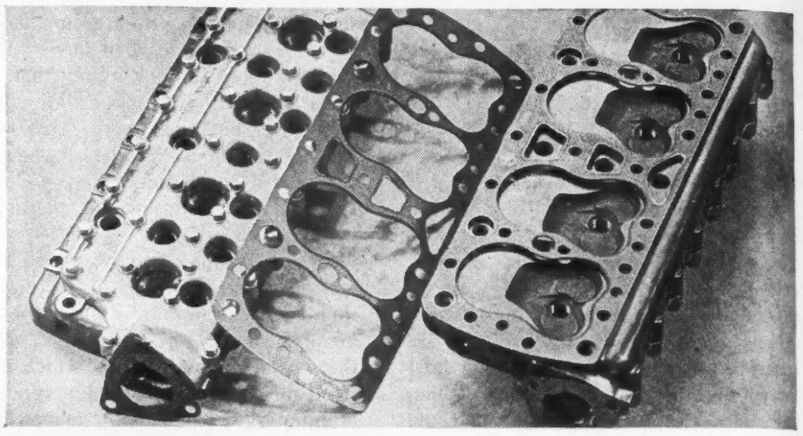
(CONTINUED FROM PAGE 89)

but at the same time has sufficient flexibility so that it can be straightened almost flat or bent almost double without breaking. It is being furnished in 25 and 50-ft. rolls with surface ground.

Federal-Mogul Parts

THREE new products of considerable interest are on exhibit by Federal-Mogul Corp.

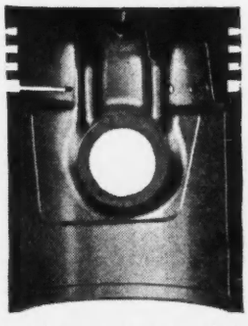
The new type camshaft bearing for Ford V-8 engines, and with it a new Camshaft Bearing Tool which makes it possible to remove the old and insert the new type bearings in a few minutes, are available. A wrench is all that is needed to operate the new tool, and it eliminates the danger of applying extreme pressure or force of any kind. It permits quick, accurate lining-up of the bearing oil holes.



Also available are the new Federal-Mogul Thermo-Flow power heads for the Ford V-8 engine, 1935-36 models. Test and actual road use have shown operating improvements with this head, which is cast from a new copper alloy. More power, greater fuel saving, faster acceleration and less carbon are among improvements claimed. The new cylinder head is suited for truck, bus, marine and car use.

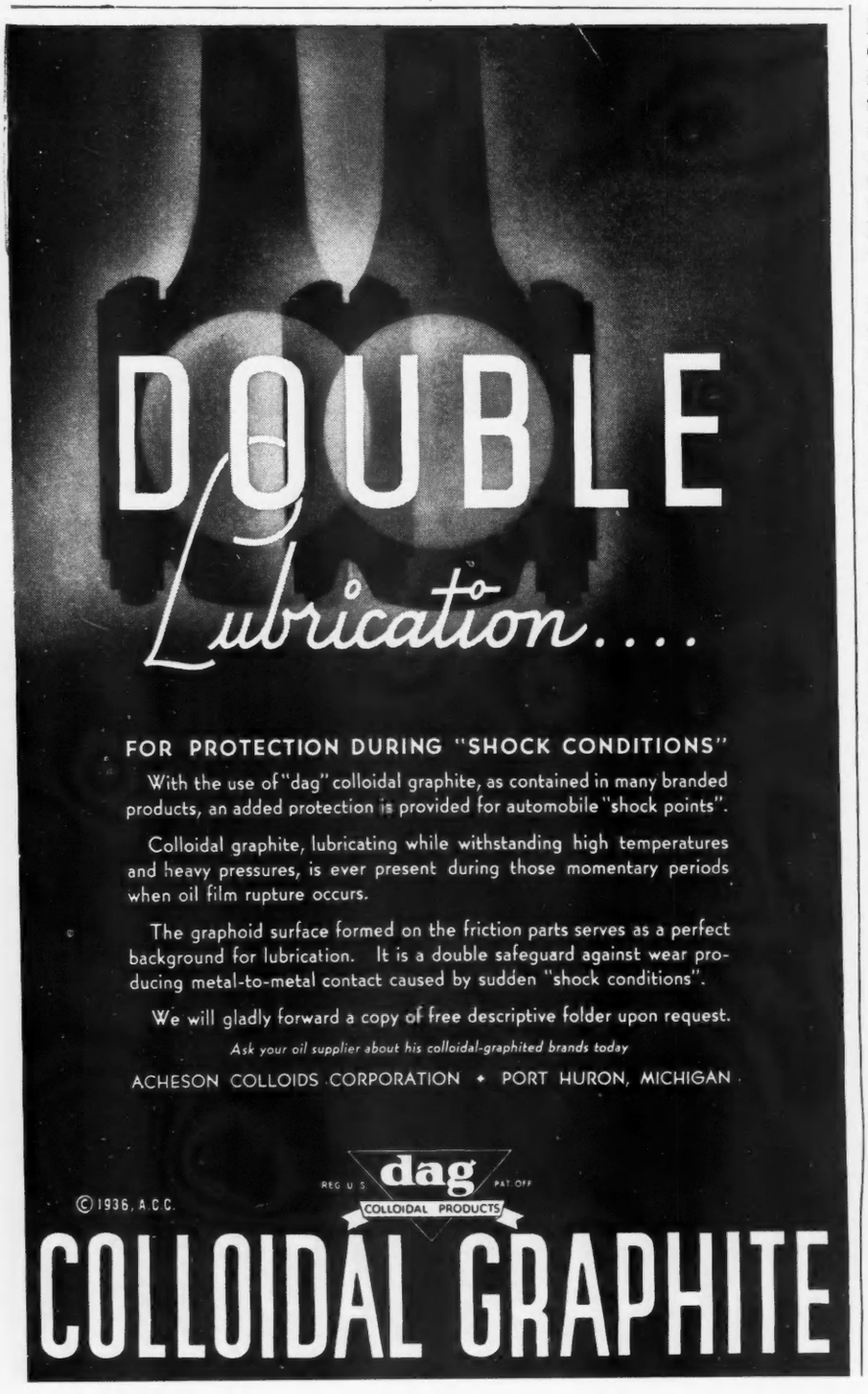
Thompson Piston

A DOUBLE-THICK skirt, extra heavy top ribs, diamond-bored pin holes and larger pin bosses are features of an alloy piston offered by Thompson Products, Inc., Cleveland, for hard service in trucks, buses, tractors and passenger car engines. The manufacturers



designate this product as their "Aerotype" brand and recommend its use with a stellite-seat valve sold under the same name. The "Aerotype" piston is made of a special "Chexpan" alloy said to have an exceptionally low coefficient of expansion and other favorable characteristics for wear-resistance and strength.

(TURN TO PAGE 94, PLEASE)


DOUBLE
Lubrication....
FOR PROTECTION DURING "SHOCK CONDITIONS"
With the use of "dag" colloidal graphite, as contained in many branded products, an added protection is provided for automobile "shock points".
Colloidal graphite, lubricating while withstanding high temperatures and heavy pressures, is ever present during those momentary periods when oil film rupture occurs.
The graphoid surface formed on the friction parts serves as a perfect background for lubrication. It is a double safeguard against wear producing metal-to-metal contact caused by sudden "shock conditions".
We will gladly forward a copy of free descriptive folder upon request.
Ask your oil supplier about his colloidal-graphited brands today
ACHESON COLLOIDS CORPORATION • PORT HURON, MICHIGAN
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REG U.S. PAT. OFF.
dag
COLLOIDAL PRODUCTS
COLLOIDAL GRAPHITE

New! A popularly priced 2 ton Truck Jack

16½" High

Dealer Price $4.15 Net Higher on West Coast and in Canada.

HERE'S a Blackhawk HYDRAULIC that has just what fleet operators and shopmen need. Yes, and drivers, too! The new J-11 is built to take care of jobs up to 2 tons—and that means about 9 out of 10 trucks on the road today.

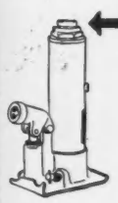
Here's what the J-11 *has:* Rugged construction—16½" *high*—9½" *low*—smooth, dependable power—adaptability to all truck styles and models.

And this is what the J-11 *does:* Insures truck operators against costly delays because it makes for quick easy tire changes and lifts truck without disturbing pay loads. Gives *safe,* satisfactory service. Takes up only small space in tool box—but is BIG in *performance.*

Your Blackhawk jobber has J-11's in stock—order NOW. Mail coupon for catalog of Blackhawk Hydraulic Jacks.

BLACKHAWK MFG. COMPANY
Dept. C J-11 **MILWAUKEE, WIS.**

Exclusive Canadian Distributor:
The Canadian Fairbanks-Morse Co., Limited
Branches in all Principal Cities



←9½" LOW

BLACKHAWK

Ask your Jobber Salesman about Blackhawk's full line of hydraulics—1 to 75 tons—including the light-heavy 5-ton Model AA-8.5 and heavy duty 8-ton Model CB-9. Coupon at right will bring you complete information.

BLACKHAWK MFG. COMPANY
Dept. CJ-11
Milwaukee, Wis.

O.K.—Send that Blackhawk Hydraulic Jack Catalog along right away.

Name .....

Address .....

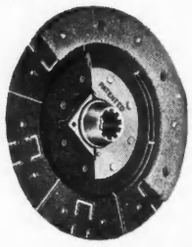
City and State .....

Replacement Parts

(CONTINUED FROM PAGE 90)

Clutch Plate

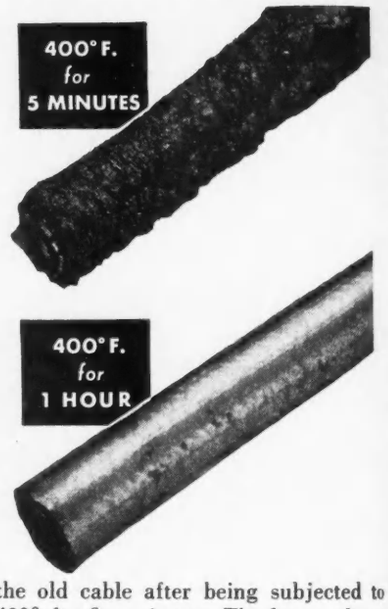
SURE-TRI-FLEX clutch plate consists of a very simple construction as to the cushion disk as well as the damper hub. The hub is made of a high carbon drop forged steel surrounded by silico manganese springs hardened and tempered to withstand the strain to which a clutch plate is subjected. The springs are inclosed by means of a series of laminations and end plates so that even in the remote chance of a spring breakage, the clutch would continue to operate.



The disk has formed alternate cushions which serve to smooth out engagements between the flywheel and pressure plate thereby eliminating the chatter which is frequently found. Using a high carbon steel, which is heat-treated, within the factory of the manufacturer, under careful engineering supervision, provides a satisfactory low gear engagement with a large measure of performance over a long period of time. Esmco Products Corp., 33 34th Street, Brooklyn, N. Y.

Sterling Cable

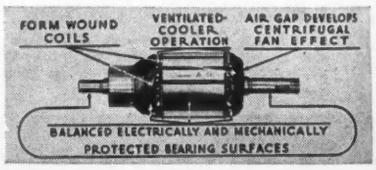
STERLING CABLE CORP., Port Huron, Mich., has developed a heat-proof, flame-resisting lacquer now being used on all Sterling silver-sheathed ignition cable. The accompanying photograph shows samples of the old and new cable after undergoing heat tests in an electrical oven. The top photograph shows



the old cable after being subjected to 400° for five minutes. The lower photograph shows the new Sterling Silver-Sheathed Cable, after being subjected to 400° for one hour. Another advantage of the new Sterling Silver-Sheathed Ingnition Cable is its unusual flexibility at low temperatures without cracking.

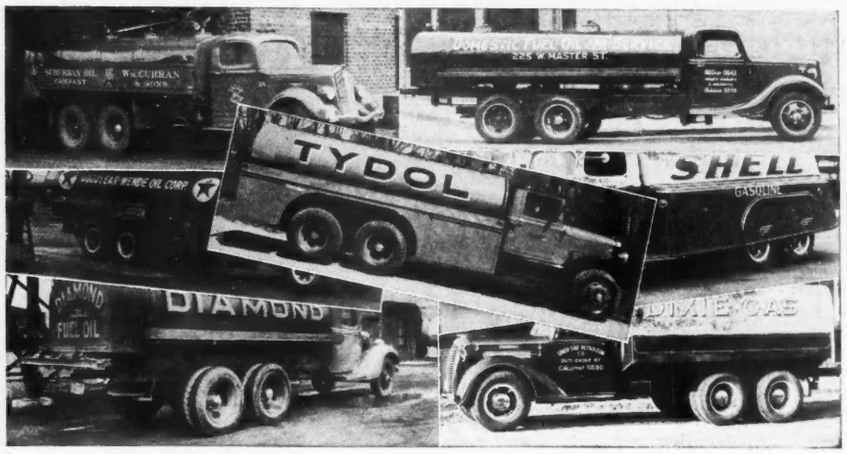
New "B-V" Armature

THE General Armature Corp., Chicago, Ill., has announced a new armature



which is said to be constructed by a special patented form winding process to insure a high degree of electrical and mechanical balance. The special construction produces a centrifugal fan effect as the armature rotates, forcing a draft of air through its coils.

TRUXMORE
WORLD'S BEST 3RD AXLE



DEPENDABLE DELIVERIES
For the Petroleum Industry . . . . And For YOU!

In spite of winter storms, gasoline and fuel oil ***must get there.***

TRUXMORE stops dangerous side-skidding and jacknifing. TRUXMORE'S Load Distribution Adjuster will shift more weight to the drive axle for better traction on ice and snow.

Test TRUXMORE'S ***knack of getting thru*** winter's worst road conditions!!

You'll also like the extra low hauling costs TRUXMORE produces.

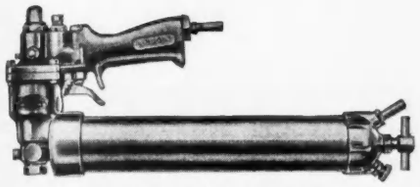
New York
Syracuse, N. Y.
Binghamton, N. Y.
Rochester, N. Y.
Erie, Pa.

1791 FILLMORE AVE.
TRUCK EQUIPMENT CO. INC.
BUFFALO, N.Y.

Chicago, Ill.
Philadelphia, Pa.
Pittsburgh, Pa.
Boston, Mass.

LINCOLN LUBRICATION EQUIPMENT

covers a Complete Range



(AIRLINE LUBRIGUN)

No matter what your lubrication service requirements are — there is LINCOLN LUBRICATION EQUIPMENT to service your fleet properly.

This outstanding line is complete, having a range that includes 1 lb. capacity guns, 100 lb. dispensing units, and also 400 lb. units. Each unit meets a specific requirement, and you will find them all fast, clean, thorough, economical — and are a great aid in lowering maintenance costs.

AIRLINE LUBRIGUNS EASY TO HANDLE

Imitated, but always in the lead, Lincoln Airline Lubriguns (illustrated above) enjoy the reputation of being the fastest, most reliable guns of this type ever produced. Convenient to handle, never tiring the operator, and built to stand up under severe service.

(LUBMOBILE)

LUBMOBILE TAKES 100 LB. DRUM

The Lincoln Lubmobile (illustrated at right) is a stationary unit of the most advanced design — typical of Lincoln's skillful engineering. This unit operates on the "two-stage" principle. Primer pump lifts lubricant from the original 100 lb. container to the chamber of the high pressure pump which delivers it under high pressure to the control valve. Handles chassis, fluid or fibrous lubricants, serves up to three outlets.

(LUBMASTER)

LUBMASTER HAS 400 LB. CAPACITY

The powerful, rugged Lincoln Lubmaster (illustrated at left) is a large capacity, high pressure chassis lubricant unit, companion to the Lubmobile, but larger throughout, and designed so that pump lifts lubricant from original 400 lb. drum. This stationary unit will serve six or seven outlets and is ideal for the requirements of the largest of fleets.

Ask for Catalog No. 50-K.

LINCOLN ENGINEERING COMPANY

General Offices—St. Louis, Mo. *Factories*—St. Louis, Mo. and Detroit, Mich.

LINCOLN
LUBRICATION EQUIPMENT

Safety Equipment

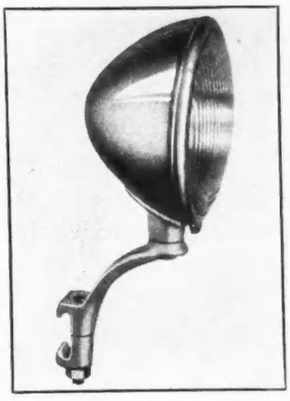
(CONTINUED FROM PAGE 31)

a pilot in the form of a sound device which warns the driver when the signal is illuminated. The signal itself may be obtained in the double arrow type or in a set of four individual lamps with brackets which make them practical for fender mounting. Front-end signals have illuminated arrows on two sides. Of particular interest to fleetmen is the fact that Turnsignal's lights are of especially heavy-duty type constructed to withstand hard wear and resist breakage of lamp or glass.

Teleoptic direction signal

The R. E. Dietz signals consist of four individual lights for each corner of the vehicle, presenting a clear warning to other vehicles from all angles. The Yankee Metal Products Corp. also offers a direction signal that will stand the gaff. This signal consists of a metal face with a silhouetted arrow and an amber pyralin backing. The manufacturer claims it is visible at a distance of 200 ft. in sunlight.

The direction signal of the K-D Lamp Co. offers several interesting features. This signal consists of two lamps, one for the front and one for the rear of the truck. The lens is amber, designed for easy visibility in fog, sunlight or darkness. The control switch is attached to the post on an extended arm so that it may be operated by the fingers without removing the hand from the steering wheel. Operation is semi-automatic, as the completion of the turn automatically brings the switch back to a neutral position. The switch has the conventional pilot light.



Unity road and fog light

BLOOD relatives of the direction signal are the marker lights and the red- or amber-reflectors. An interesting and complete line of marker lights and reflectors of various colors, intensities and sizes is offered by the K-D Lamp

Do Ray fog light

Co. Reflectors feature the solid light-transmission glass or the small reflector button in red, amber, green or crystal. The reflector of the Yankee Metal

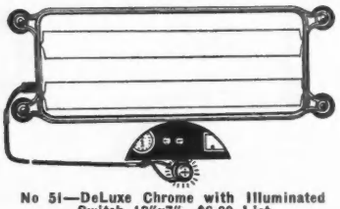
(TURN TO PAGE 98, PLEASE)

DON'T DRIVE BLINDFOLDED

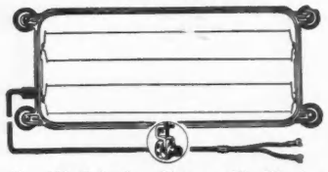
Buy a CASCO Defroster

DON'T take chances. Sleet storms give no notice. Blind driving, slippery roads, delayed schedules, strain on drivers.

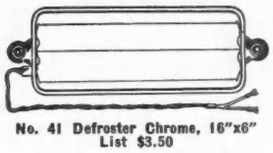
Equip every car, truck and bus with CASCO Electric Defrosters and be sure of clear vision and safe driving. Do it now—be ready for winter driving hazards.



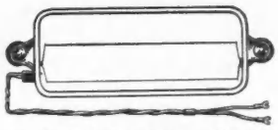
No 5i—DeLuxe Chrome with Illuminated Switch 18"x7"—$6.00 List



No. 196 Defroster—Chrome with Illuminated Switch 16"x7", List $5.00



No. 41 Defroster Chrome, 16"x6" List $3.50



No. 26 Defroster—Chrome—13"x5⅛" List $2.25

SPECIAL FEATURES

CASCO Positive Grip Suction Cups hold securely.

Glass set in live rubber channel.

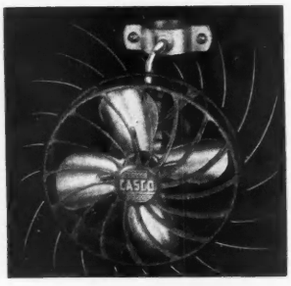
Also Non-Electric Defrosters for side and rear windows.

● CASCO Electric Defrosters POSITIVELY remove Ice — Sleet — Wet Snow under ALL conditions. They supply just enough heat at the exact place it is needed. Use very little current.

● CASCO Electric Defrosters PREVENT FROST from forming on the *inside* of windshield *without* use of current.

DOUBLE ASSURANCE FOR CLEAR VISION

● The quality and performance of CASCO Electric Defrosters is assured by over eight years' experience, development, and improvement.



CASCO

Keep frost off inside of windshield in winter—circulate cool breeze in summer. Attach to steering post or on header board. Has an efficient, dependable motor, sturdy fan and attractively designed guard.

No. 35 DeLuxe Model $3.75 list
No. 36 Standard Model $3.50 list

Also Illuminated Switches for Defrosters and Hot Water Heaters, Fender Guides, Cigar Lighters.

ORDER FROM YOUR WHOLESALE HOUSE

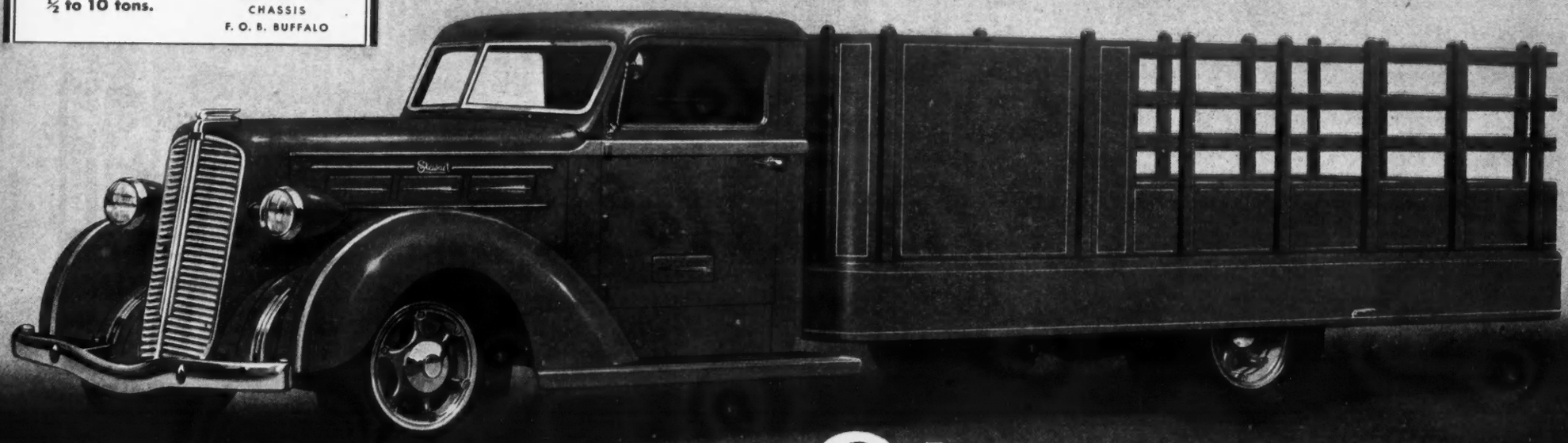
CASCO PRODUCTS CORP., BRIDGEPORT, CONN.

Style WITH DEPENDABILITY

The new 1½-ton 1937 Stewarts offer something really new—beauty of design backed by dependability. Added to the Stewart time-proven mechanical features are many new improvements—better load distribution—accessibility of working parts for quick adjustment—more power and greater gasoline economy. ★ ★ At last, a big roomy modern cab—wide adjustable seat—ample leg-room—double cowl and door ventilators—narrow corner posts—better driver vision—real passenger car comfort. ★ ★ The new 1937 Stewarts are built for tough service and styled to sell. Stewarts for 24 years have earned a world wide reputation for long life, economical service—"Stewart Trucks Have Won By Costing Less To Run". Today Stewart's advanced styling teams up with this low cost dependability. ★ ★ Dealers! Our franchise requirements are liberal. Write or wire for details.

STEWART MOTOR CORPORATION, BUFFALO, N. Y.

THE NEW 1937
1½ TON STEWART
Other models from $495 up. Capacities ½ to 10 tons.
$595
CHASSIS
F. O. B. BUFFALO



Stewart
MOTOR TRUCKS

(CONTINUED FROM PAGE 96)

Products Corp. consists of a silver-plated glass lens set in special cushioning asphaltum, making it shatter-proof. It is visible up to 1000 ft., so claims go.

The Delta reflex-a-lite reflector is different from the conventional reflector design in that it is constructed like a spotlight. However, it uses no bulb. It is designed to pick up every beam of light and reflect that light with its intensity practically undiminished.

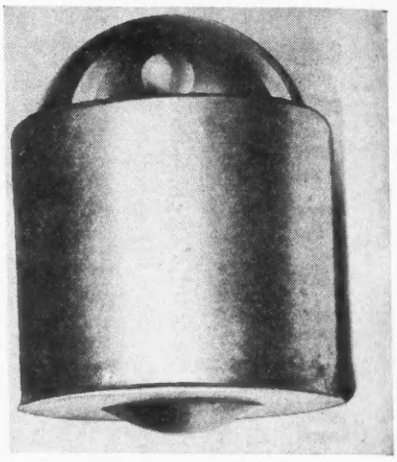
The fog light also plays a vital role in highway safety. Approximately half of all accidents occur at night and poor visibility has contributed its share.

McCord hot water heater

The practicality and usefulness of the Dietz fog light is not outdone by this company's other lighting devices for trucks. The Dietz road and fog light, when mounted low, casts a powerful beam along the edge of the road. The amber lens throws a yellow light unmistakably when visibility is poor.

The Ambo-White lens of the Do-Ray fog light is so constructed that the light rays are concentrated in a horizontal oblong pattern that lights the roadway but does not throw the light upward. Likewise, the amber lens does not cut down on the intensity of the light due to the special process to which the white glass is subjected.

The road and fog light of the Unity Mfg. Co. is efficiently constructed, possessing the features of Unity's well-known safetylight. It is a fixed bumper

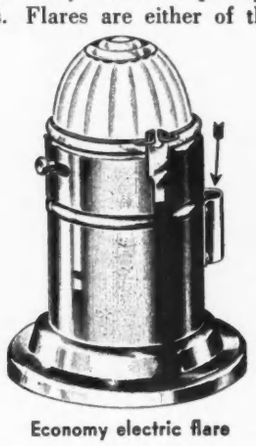


Turnsignal's wet cell flare

light, and when mounted in that position, it throws a wide beam across the path of the vehicle.

The Guide fog light also has excellent mist penetrating ability.

AN important highway safety instrument is the road flare which has served to guide many motorists past parked vehicles. Flares are either of the dry



Economy electric flare

cell electric type, such as those marketed by the Economy Electric Lantern, which can be set either to burn

(TURN TO PAGE 102, PLEASE)

The NEW HAYS "ORSATOMAT" AUTOMATIC ORSAT

WILL ANALYZE FLUE GAS

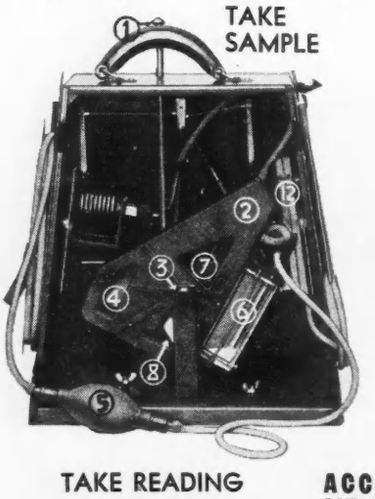
with ONE MOVEMENT

SIMPLE *as turning a knob*

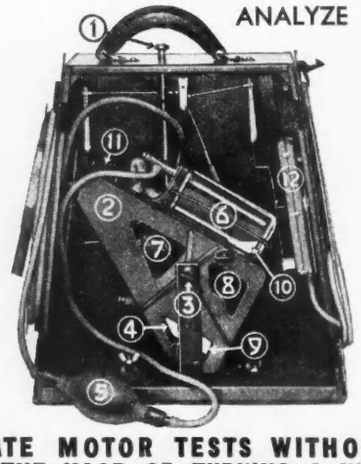
RESULTS PLAINLY INDICATED ON LARGE LEGIBLE SCALE

In 20 *seconds*

TAKE SAMPLE



ANALYZE



TAKE READING

ACCURATE MOTOR TESTS WITHOUT LIFTING THE HOOD OR TURNING A NUT! NO ELECTRICAL CONNECTIONS REQUIRED

Revolutionary new design based on the time tested accuracy of the orsat principle gives simple operation as follows: SAMPLING POSITION: Rod (1) up tilts analyzing body (2) on bearing (3). Gas is pumped into measuring chamber (4) with aspirator (5) by-passing to atmosphere through automatic valve (6). The steel wool in absorption chamber (7) is immersed in the absorbing chemical in this position. Notice the draft unit (12).

ANALYZING POSITION: Rod (1) down pivots analyzing body (2) on bearing (3) sealing the intake (9) and enclosing automatic valve (10) allowing mercury from reservoir (8) to flow into measuring chamber (4) displacing the sample forcing it into intimate contact with the chemical-laden steel wool in the absorption chamber (7). The absorbed gas creates a vacuum transmitted by metallic bellows (11) to the CO_2 pointer shown on the front view.

MAIL COUPON

Please send us complete information on the revolutionary new portable instrument, the Hays Orsatomat (the automatic orsat).

Name .....

Company .....

Address ..... F.O.J.

MOVE THE ROD—THE ORSATOMAT DOES THE REST

THE HAYS CORPORATION

COMBUSTION INSTRUMENTS SINCE 1901

MICHIGAN CITY, INDIANA

How Do Spark Plugs Affect Performance and Economy?

Spark plugs affect the performance and economy of bus and truck operations in many ways. Inferior quality spark plugs, spark plugs that have been in service too long, or incorrectly specified types add to maintenance costs at an alarming rate. Power losses result which in turn mean wasted fuel, severe strain on gears and bearing surfaces, and all around loss in efficiency.

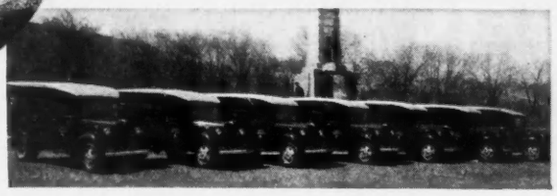
There is no more severe spark plug service than in buses and trucks where very often routes or even climatic conditions may determine the correct type of spark plugs. Roadside delays or interrupted schedules obviously cost all out of proportion to the price of replacement. That is why haulage costs and fleet or unit efficiency are vitally affected by spark plugs and why the most outstanding fleet operators specify Champions.

If you feel that your spark plug costs and efficiency are out of line, our factory trained field representative will welcome an opportunity to consult with you. Constant research and an almost daily contact with operating problems in the field put us in a position to satisfy you that with Champion Spark Plugs you can meet and solve your problem.

The County Garage Dept. of Ventura County, Calif., operate over 150 pieces of diversified equipment to maintain their roads from sea-level on a forty-mile coast line to altitudes of 7500 feet. Naturally Champions are used to render unfailing service under severe conditions.

Florida Motor Lines, Jacksonville, Florida, practically blanket Florida with their bus lines and use Champions to maintain dependable service.

Taylor Truck-A-Way, Ltd., Wilmington, Calif., operate 74 Champion-equipped Ford Truck-Trailer units over 1,500,000 miles yearly.



Swift & Co., Chicago, Ill., use Champion Spark Plugs in the delivery of Premium Hams, Bacon and Sausage.

Champion

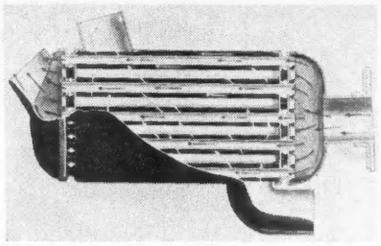
EXTRA-RANGE SPARK PLUGS

Use the Spark Plug Champions Use

TO KEEP ENGINES YOUNG, TEST, CLEAN AND REPLACE SPARK PLUGS AT REGULAR INTERVALS

(CONTINUED FROM PAGE 98)

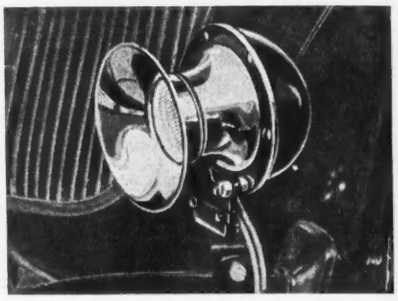
steadily or to flicker, and the battery flare of the U. S. Electric Mfg. Co. The Usalite flare has a white as well as a red lens and serves as a repair or danger light. The Turnsignal flare uses an electric bulb set in a covered, air-tight container having a wet cell. The Turner Brass Works flare is of the conventional tank design burning gasoline. It produces a powerful light which may be used for many purposes. The K-D flare is of similar design. The red flare of the American Railway Signal Co. is a long fuse type flare which will burn in any weather and may be ignited without matches. The burning chemicals are non-explosive.



Houde cab heater

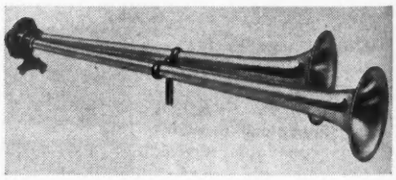
Blind driving would be notoriously dangerous but for the saving feature of defrosters which make going in snow and sleet safe. Among the various types of defrosters are the electric coil types, warm air ducts, fans, chemically treated wiper blades and frost-remover compound. Among the electric types are those marketed by Casco and Gasco. Houde features a warm air defroster. Two of the wiper blade types which are chemically treated are Anderson Sleetmaster and the Sleetex blade. Both use replaceable cartridges. Another type is a compound spread over the glass by hand which melts ice, snow and sleet known as the Jiffy frost remover.

ANOTHER important element in safety is driver comfort and to this end the cab heater has proved a blessing. The Houde heater incorporates the Houdizing bonding process whereby outside air is drawn in to circulate through the seamless heater unit and then the heated air is passed into the cab. The principle is akin to that of air conditioning.



Klaxon horn

The N type Kysor heater designed especially for trucks is mounted under the hood with the hot air outlet extending under the dash. This heater also draws air from the outside, heats it and shoots it into the cab. Hot water passing from the engine into the core of the heater element may be controlled, thus controlling the amount of heat given off.



Buell air horn

The B. F. Goodrich boiler type hot water heater has several interesting features. One is the special heat trap which provides full, steady heat while driving at any speed. The other is a universal deflector designed to really throw heat in any direction. An angle tube core provides about 35 per cent more heating surface than some other types of tubes.

Two utility heaters are the McCord

(TURN TO PAGE 107, PLEASE)

HEIL Quality PRODUCTS

HOISTS AND BODIES
ROAD SCRAPERS
TRUCK TANKS
SNOW PLOWS
STORAGE TANKS
DEHYDRATORS
BOTTLE WASHERS
OIL BURNERS
WATER SYSTEMS

INTRODUCED in 1918 the patented Heil twin cylinder hydraulic hoist (incorporating the principle of direct application of power to the load) soon satisfied dump truck operators that here was a dumping unit that had the power and the stamina to dump any load —anywhere—anytime . . . Today the roster of Heil users includes the names of tens of thousands of satisfied Heil boosters—and the complete Heil line includes: Slant-Type Dump Units—Hopper Hi-Lift Units—Jack-Knife Hi-Lift Units—Telescopic Hoists and the original Heil Twin Cylinder Dump Units . . . By all means get Heil recommendations before you buy . . . Your nearest Heil representative is prepared to give you complete facts and figures or send direct to the factory for latest Heil Hoist, Body and Tank Manual—Address:

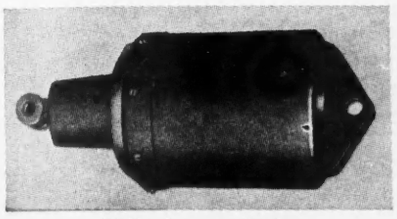
THE HEIL CO.
FACTORY AND GENERAL OFFICES
3000 W. MONTANA ST., MILWAUKEE, WIS.
BRANCH FACTORY:—HILLSIDE, N. J.
BRANCHES AND DISTRIBUTORS EVERYWHERE

(CONTINUED FROM PAGE 102)

and the Holle Supreme. The McCord boasts special down-draft louvers for directing heat along the floor of the cab, and is designed for back of gear shift mounting. Low price as well as utility feature the Holle Supreme.

EQUIPPING the cab and chassis with safety units would prove of little value if the vehicle lacked the extra stopping ability assured by power brakes. Lathan Besler offers a power brake hook-up with dual installation on the axle which assures self-equalizing brakes. This brake is easily adapted and requires no extra bearings, shafts or clevis pins to install or maintain.

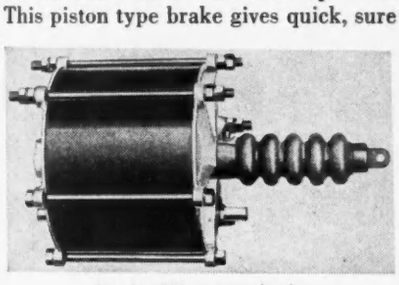
The Midland Steel power brake is adapted to all types of trucks and is



Midland power brake

featured by light weight, simple design and sturdy construction. In installation, it does not disturb the mechanical hook-up, and the reaction type valve gives any degree of control desired.

The Bendix B-K power brake needs no introduction to the fleet operator. This piston type brake gives quick, sure



Bendix BK power brake

action. Power application is fully controlled. Of particular interest to fleetmen using the Bendix brake is the nation-wide exchange plan which assures safe braking at all times at small cost. Along with the Bendix power brake must be included the Bendix-Westinghouse air brake with compressor operating from the engine.

The Berg power brake with reactionary control gives safe stopping action under all conditions. This is a reasonably low priced brake designed for utility and performance.

STOPPING ability assured by power brakes is good, but so is starting ability, and here the tire chain plays its role. Of particular interest is the positive traction assured by the dual wheel chain offered by Tropic-Aire. This is a single chain which fits between the

Fulton shaft driven fan

dual tires and which holds a non-skid bar firmly across the face of the two tires. The bars are independent of the chain and as many or as few may be used as desired or needed.

Other types of chains designed for traction in tough going are the claw type chains of Columbus-McKinnon so designed to grip the road surface firmly; the McKay multi-grip double bar reenforced chain which gives sure traction and particularly possesses long life. In the matter of chain repairs the International Mfg. Co.'s Linklox permits easy and quick replacement of

(TURN TO PAGE 110, PLEASE)

29°
16 SPLINES-EQUALLY SPACED
NOTICE these SPLINES
▼ 16 of them; instead of the ordinary 10 splines
▼ sloping sides; wider at the base and shallower
▼ stronger splines—much
▼ equi-strength splines, we call them; because shaft splines and side-gear splines are identical in shape and strength.
▼ A tremendous improvement.
▼ You can't go wrong—except by choosing some other shaft.
▼ IMPORTANT—the 16 spline shaft is trademarked, labeled, patented.
THE TIMKEN Torsion-flow AXLE SHAFT
THE TIMKEN-DETROIT AXLE COMPANY
Detroit, Michigan
WISCONSIN AXLE DIVISION
Oshkosh, Wisconsin

DRESS UP THE

Ditzler Quality Products include:

PYROXYLIN PRIMERS, SURFACERS, STRIPINGS, THINNERS AND STANDARD LACQUER COLORS.
SYNTHETIC PRIMERS, SURFACERS AND QUICK DRYING ENAMELS.

TRUCK FLEET WITH

1937 Colors

IN selecting enamel finishes for truck, bus, or van, specify the most up-to-date, modern colors.

Whether you are refinishing an old job, or selecting the color for a new vehicle, you can find a color combination in the Ditzler line that will give it distinction and greater advertising value, as well as greatest possible protection.

Ditzco Enamel has many advantages over old time enamels. It is quick drying . . . high in solids . . . goes farther . . . produces a finer, better job for less money. Adapted to wood, metal, or old finishes. Dries dust free in fifteen to twenty minutes at room temperature.

Ditzco Enamel stands frequent washing . . . holds its rich, deep color and lustre longer. It is just the finish needed to maintain commercial vehicles in good condition for more paint miles . . . cuts down maintenance costs and protects the vehicle longer.

Ditzler products are quickly available through a nationwide jobber service. Ask your jobber for color card and a copy of the new Ditzler Repaint Manual.

DITZLER COLOR COMPANY - DETROIT, MICHIGAN

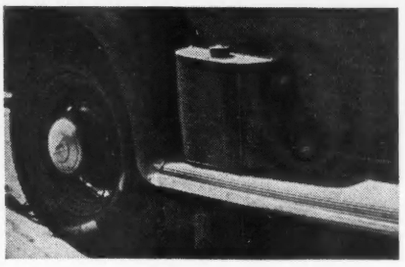
DITZLER

STANDARD IN THE AUTOMOTIVE INDUSTRY SINCE 1902

(CONTINUED FROM PAGE 107)

broken links. It will not gouge out holes or injure the tire in any way.

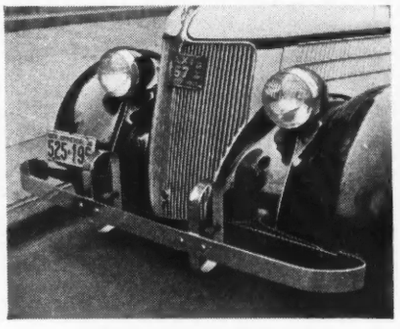
In the light of approximately 40,000 accidents yearly due to skidding, sanding devices should prove of particular interest. Their greatest value is in providing traction on wet or icy roads and on hills, especially when the driver experiences difficulty in starting. The Lintern sander offers protection against skids and assures traction on bad road surfaces, too. Lintern has both an air and electrically operated sander for trucks, trailers and passenger cars. The equipment consists of sanding valves



Lintern sander for passenger cars

distributors for single or dual wheels. Sand flows by gravity, but is operated by the driver either with a hand switch or by automatic operation from the stop light switch, so that whenever the brake is applied sand will flow, or from a locked postion on the operating handle which will allow sand to flow steadily for use especially on grades. On truck or trailer the hopper is attached to the chassis frame. On cars the hopper sets on the running board on each side of the body. Junior models for cars have a capacity of 50 lb. of sand. The distributor has a fan-shaped nozzle to spread the sand and is designed not to clog. The hopper is easily attached.

LAST but not least in safety equipment are such important units as the Nichols-Lintern ventilating system which assures a constant change of air in the cab without creating drafts. In line with ventilating systems are cab fans. These are of two types: those electrically operated and those driven by the fan belt. The Samson United

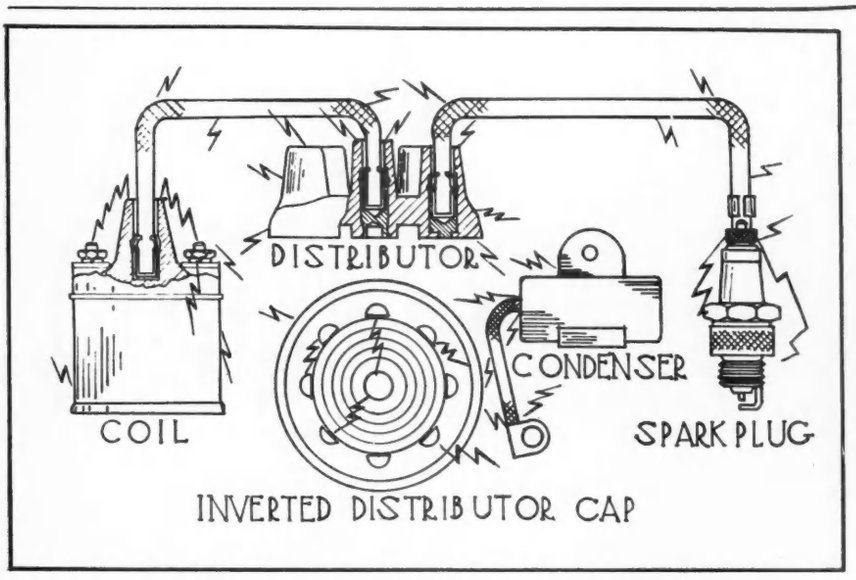


Safety cushion bumper

fan with a six-volt motor features flexible blades that do not require guards. Two other types of electric fans are the Casco fan and the Ashton's Gopher fan. The Fulton fan is of the shaft-operated type driven by the fan belt. Additional safety accessories recommended are the Pines S.O.S. switch which automatically cuts off the switch

Pines safety switch and stop light

in case of an accident; the Safety Cushion bumper specially constructed to absorb shock, and the Buell and Klaxon type horns. A universal adjustable heavy-duty truck mirror is the proud product of American Automatic Devices. This mirror may be set at any angle with extended or retracted arm.



INSUL-IZE

Restore the Efficiency of Entire Ignition Cable System At Fraction of Replacement Cost.

Red Insul seals high tension currents, making the ignition system an efficient, one-piece unit, preventing current leakage and creating a direct route for full, hot sparks.

Red Insul instantly starts motors stalled by water or moisture. We guarantee that an Insul-ized ignition system will positively not stall or fail to start the motor because of dampness or wet weather. Many of the country's largest fleets use and highly recommend Red Insul. Let us give you further details and make a test on your equipment.

RED INSUL
No 323,507

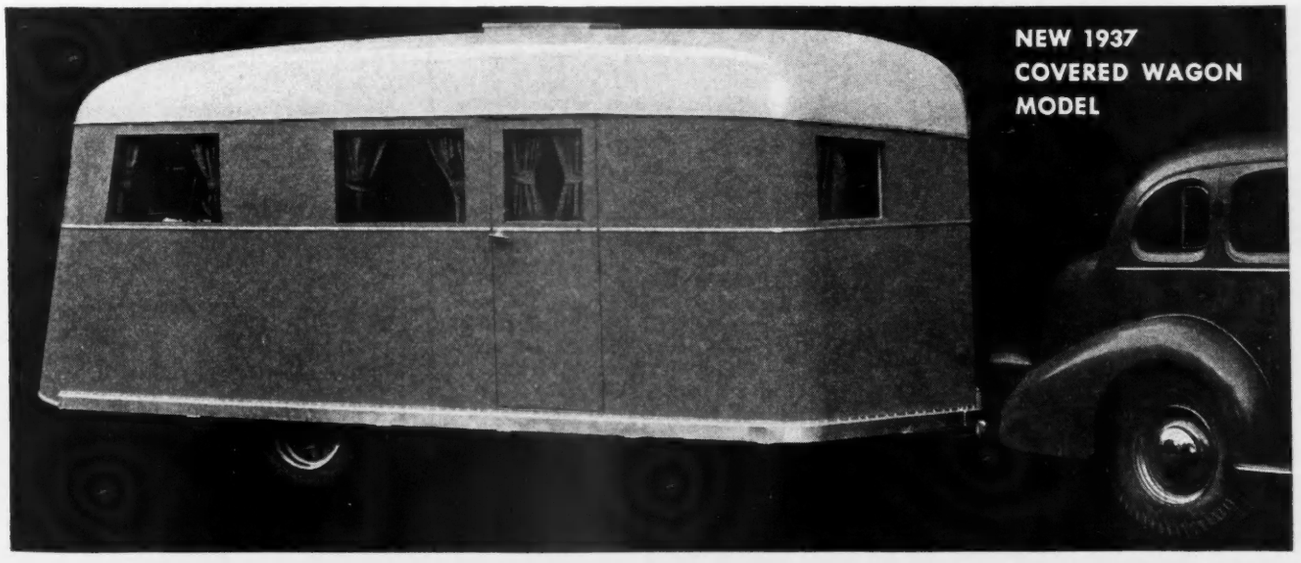
Be Wise—Insul-ize

Insul Products Co.
521 Fifth Avenue
New York

ANOTHER BIG INDUSTRY 'PLYMETL' says

5 Reasons Why..
1 Steel construction to meet fire and collision hazards.
2 High insulation value impossible with cold steel walls.
3 Operating economy made possible by the elimination of dead weight and exterior repairs.
4 Plymetl trailer bodies have a higher resale or trade-in value.
5 No space-eating inside braces or supports are needed for rigidity and strength.

If the nation's idle capital and labor are to be re-employed, new industries are needed. At the very head of the new products which America has originated to take up this slack is the auto trailer. And at the very head of the materials best suited for trailer body construction stands Plymetl. Though Plymetl for trailer bodies is strong as steel, and fireproof, it is exceedingly light in weight, and thus cuts down the ease and cost of trailer hauling. Moreover, no space-eating inside braces or supports are needed to give it strength and rigidity. No wonder the Covered Wagon Company has turned to Plymetl. It's the strongest, flattest, and, weight for weight, the lightest and most durable material which can be used for trailer body construction.



OFFICES IN CHICAGO • DETROIT • NEW YORK

HASKELITE MANUFACTURING CORPORATION

208 WEST WASHINGTON STREET • CHICAGO, ILLINOIS

Engines & Accessories

(CONTINUED FROM PAGE 26)

supplemented by a whole host of gasoline and Hesselman engines which are a spark ignited fuel oil engine. The sizes and abilities of the Hesselman and gasoline engines cover the whole range of engine uses in trucks.

Naturally, since engines are the most important unit of a truck, the engine manufacturers have felt their responsibility and are building engines as best they know how. But the resources of the engine builders do not stand alone in this fight for better operation at less cost. The efforts of the engine builders are supplemented by the developments of the engine accessory makers who spend their time developing devices to protect the engine.

Oil Filters

AT this writing oil filters seem to be getting the most attention as engine equipment. Within the space of a few years oil filters have progressed from a strainer that would remove about 25 per cent of the coarsest abrasives that found their way into the oil, to a real engineered filter or purifier that will keep the oil strictly to new oil specifications in most respects. Most filters at present will stand the "dirty dipstick" test as a quick appraisal of the filter or the need for a cartridge change and for complete rating of the filter and

(TURN TO PAGE 116, PLEASE)

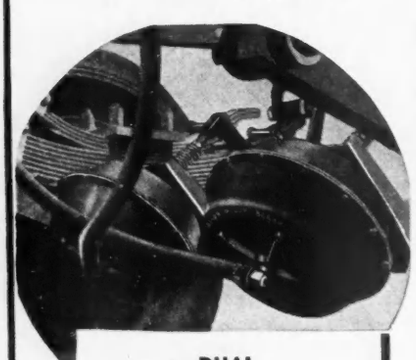
40° Below ZERO
did not retard their action

Says a big Fleet Operator, of—

★ LATHAN BESLER

Engineered

POWER BRAKES



DON'T let "frozen" brakes slow up your winter hauling or increase your winter maintenance. Equip with LATHAN-BESLER *Engineered* Power Brakes. The same swift, smooth action ALWAYS, even during weeks of sub-zero weather with the brake mechanism packed in snow and ice. DUAL INSTALLATION on the axle makes application SELF-EQUALIZING, preventing skidding. And records of 175,000 miles per unit without maintenance or repairs, proves ECONOMY unmatched in all the field. Complete line. Nation-wide sales and service. Get the FULL facts and COMPARE. Write TODAY for LATHAN-BESLER Catalog.

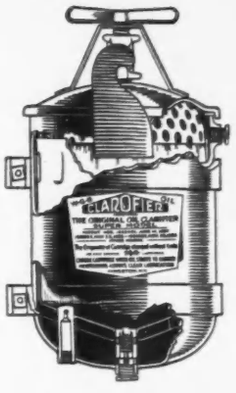
LATHAN CO., Inc.
SAN FRANCISCO—Polk and Pine Sts.
DETROIT—477 Selden Ave.

DUAL INSTALLATION
ABOVE: LATHAN-BESLER DUAL installation on the axle. Quicker, easier installation. DIRECT brake action. No power loss. Self-equalizing application. Less wear on tires and brake lining. No skidding. No extra bearings, shafts, or clevis pins to install or maintain.

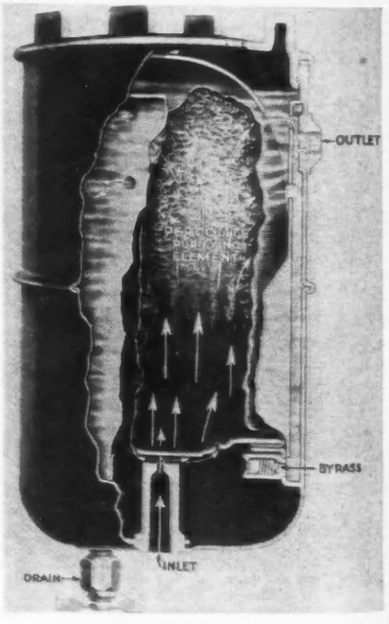
"LOCOMOTIVE CONTROL"
The ONLY completely modern power brake with a road-proved system of graduated, self-compensating trailer control as dependable and effective as that used on railroad trains.

PROVED IN YEARS OF USE BY THE NATION'S LARGEST OPERATORS

Purolator oil filter

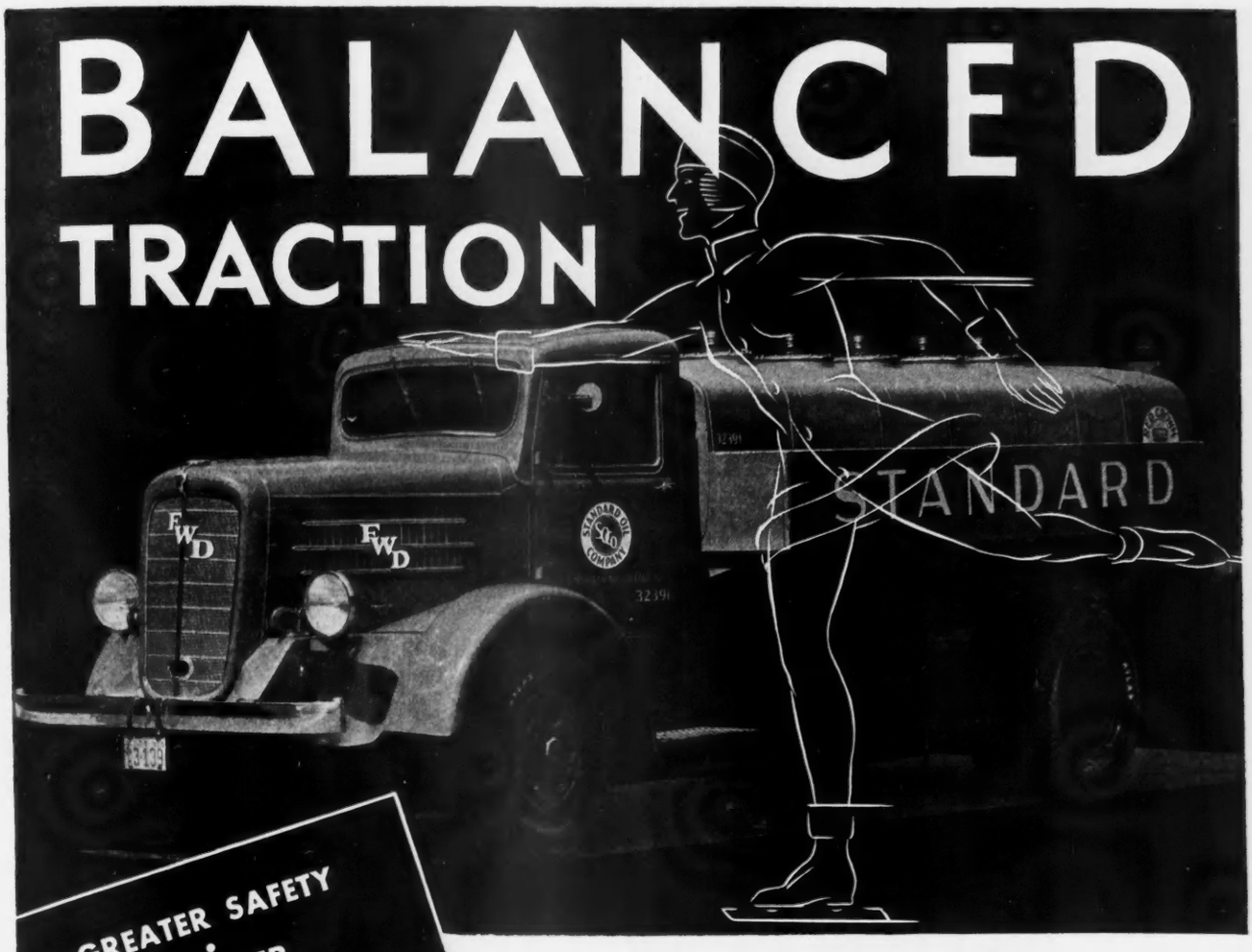


WGB oil clarifier



Handy oil filter

BALANCED TRACTION



GREATER SAFETY
•
GREATER DEPENDABILITY
•
FASTER SERVICE
•
WIDER RANGE OF OPERATION
•
GREATER ECONOMY OF OPERATION

FWD
FOUR-WHEEL-DRIVE
TRUCKS

Controlled Power
enables the FWD Truck to "Take" roads as they come

In every trucking service where positive traction is essential to negotiate roads under tough conditions — the FWD Truck will perform dependably and economically . . . Its four-wheel-drive principle, that of power and load distribution, gives it positive traction in mud, sand, loose soils, snow and on slippery pavements. In the construction of the FWD, a center differential is used to distribute the power equally to the four driving wheels . . . Its reserve power, rugged construction throughout, and true application of the four-wheel-drive principle, insure continuous operation under any conditions. You'll find speed, safety, dependability, economy, and unmatched performance in the FWD — the pioneer of Four Wheel Drive Trucks.

Let us give you the details of FWD Controlled Power.

THE FOUR WHEEL DRIVE AUTO COMPANY
CLINTONVILLE, WISCONSIN
***Canadian Factory*, KITCHENER, ONTARIO**

THE SAFEST TRUCK ON THE HIGHWAY

(CONTINUED FROM PAGE 114)

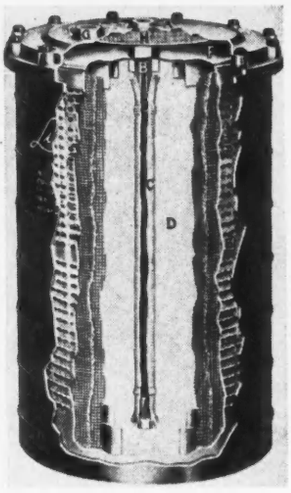
analysis of the crankcase drainings.

Each of the filter manufacturers has developed a filtering element for which they have found unusual merit. AC uses igneonite, Briggs Clarifier Co. uses Fuller's earth and metal cloth. The purifying element in the Handy filter is known as Percolite, the Luber-Fine Oil Refiner material is unnamed while Purolator has a vegetable product known as Multocell. WGB and DeLuxe use an especially prepared cotton thread material. The Edde element will remove and prevent the formation of acids and the Kralinator rests on its filtering efficiency. Closely associated with conditioning of crankcase oil is the work performed by a new device by American Chain called the Tru-Level

(TURN TO PAGE 118, PLEASE)

Kralinator oil conditioner

Briggs oil clarifier



Luber-Fine oil filter

Edde oil filter

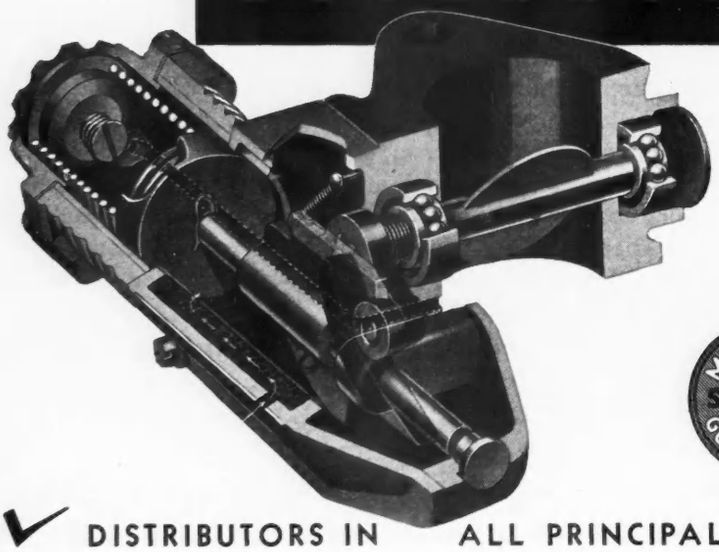
There IS a difference!

● Each day throughout the country, more and more fleet operators who have tried them all standardize on Monarch Governors. The reasons? Here are a few—check them over.

- ✓ Only governor with balanced throttle, made possible by exclusive vacuum principle—no interference with fuel distribution, power, or acceleration.
- ✓ Ball bearing equipped throttle and diamond bored precision cylinder construction—insures frictionless performance.
- ✓ Exclusive air cleaner assures longer, trouble-free service.
- ✓ Impossible for driver to exceed set governed speed by "cheating" or "stealing."
- ✓ Approved, recommended, and used by leading truck manufacturers.

MONARCH GOVERNOR CO., DETROIT, MICHIGAN

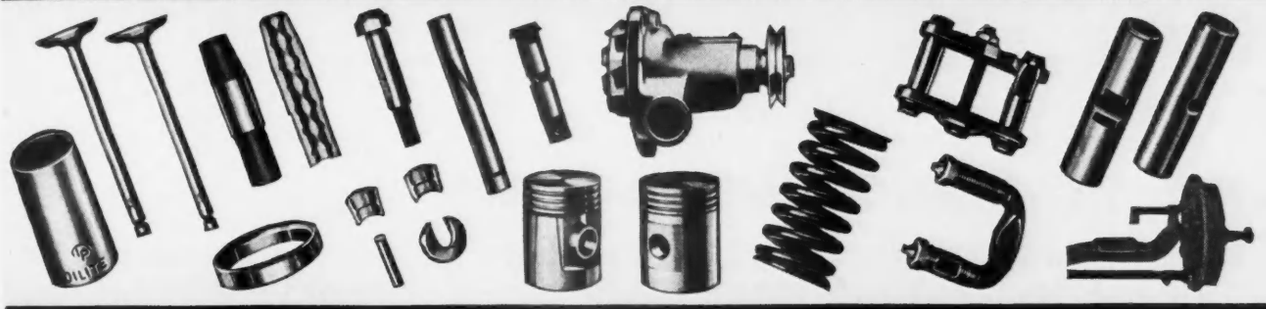
MONARCH GOVERNORS



MONARCH SINCE 1913 GOVERNORS

✓ DISTRIBUTORS IN ALL PRINCIPAL CITIES

"WE FIND THAT THOMPSON PARTS



DEFINITELY REDUCE OPERATING COSTS!"

• These statements made by H. G. Woods, President and General Manager of Toronto-St. Catharines Transport, Ltd., are typical of voluntary reports which come to us from large fleet operators everywhere. The Toronto-St. Catharines Transport line keeps 40 of these units in constant service, averaging 3,000,000 miles yearly. They have had ample experience with motor and chassis replacement parts and have proved, as you can prove, that it pays to standardize on Thompson Products.

THOMPSON PRODUCTS, INC. • Cleveland • Detroit

Thompson Products

(CONTINUED FROM PAGE 116)

Oil Controller. This is a metering device with a reservoir from which oil is fed to the crankcase as required thus keeping the oil at the proper level.

Air Cleaners

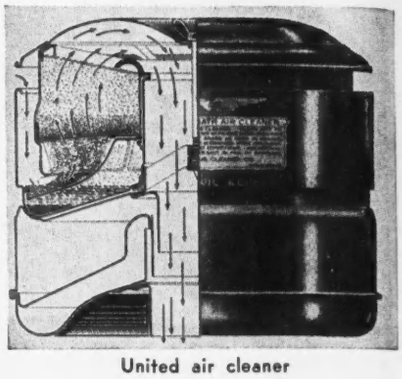
FURTHER protection to the precious power plant is provided by air cleaners which prevent the carburetor air intake from becoming vacuum cleaners playing housemaid to the highways of America with the engine performing the function of dust bag. There are roughly two ways of keeping the air clean. One is to direct it through a mass of lubricated steel wool or equivalent and the other is to force it through an oil bath. AC, Handy and United air cleaners are illustrated.

Governors

IT is impossible to discuss engines and engine accessories without bringing in governors. No engine, no matter how good, can long stand being operated in excess of its rated speed. The governor manufacturers have concentrated recently on a governor that

(TURN TO PAGE 122, PLEASE)

Tru-Level oil controller

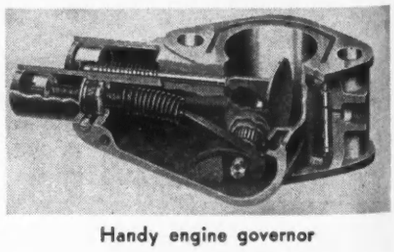


United air cleaner

Handy air cleaner

AC air cleaner

Monarch governor dash control



Handy engine governor

A WISE BUYER BUILT THIS BODY

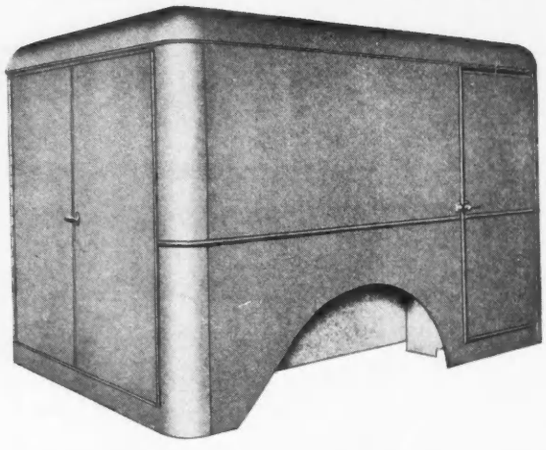
●

STREAMLINED WEIGHT

SPECIFICATION-BUILT

STRONG AS STEEL

●



ONLY MET-L-WOOD HAS ALL THREE

A wise buyer knew what he wanted and he got it from a licensed Met-L-Wood Body Builder.

Streamlined Weight—Met-L-Wood's exclusive construction of wood and steel laminations cuts out dead, profit-killing weight.

Built to your specifications—Met-L-Wood specification-built bodies are not only feasible but they may even cost less. Details of construction are possible which no other material could hope to imitate near Met-L-Wood's price.

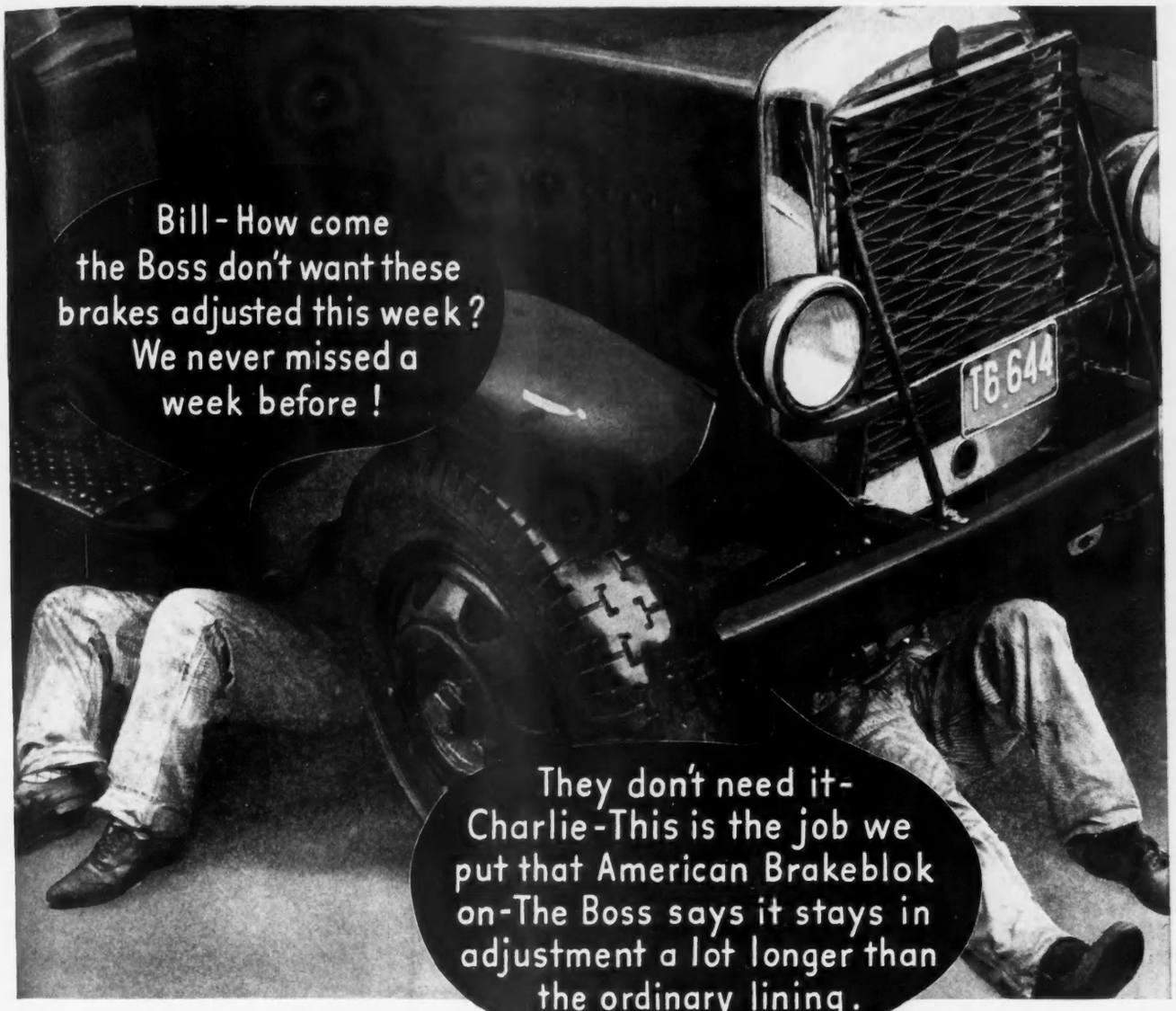
Strong As Steel—Stronger than any all-steel body of heavier construction. Top, side walls, bottom are Met-L-Wood and that means this body can take it.

If you do not know the name of the licensed Met-L-Wood builder in your neighborhood write to us and our representative will gladly quote on body jobs.

Write today to

MET-L-WOOD CORP.

6755 W. 65th Street **Chicago, Illinois**


Bill - How come the Boss don't want these brakes adjusted this week? We never missed a week before!
T6 644
They don't need it - Charlie - This is the job we put that American Brakeblok on - The Boss says it stays in adjustment a lot longer than the ordinary lining.

A "break" for the Boys in the Shop as well as the Man at the Top

● Maintenance superintendents like American Brakeblok because it cuts down labor time in the shop. Slow, even wear and the absence of swelling or separating under high braking heats eliminate many an hour spent in too-frequent brake adjustments.

Naturally, the Man-who-pays-the-bills likes it too. Not only does it reduce costs, but it also reduces the possibility of accident. It gives quicker, smoother stops under all conditions.

Ask your jobber about the experiences of other fleet operators who use American Brakeblok.

AMERICAN BRAKEBLOK CORPORATION, 4600 Merritt Ave., Detroit
A Division of American Brake Shoe and Foundry Co.

American Brakeblok

AMERICAN BRAKEBLOK

THE SAFETY BRAKE LINING

Engines & Accessories

(CONTINUED FROM PAGE 118)

can be adjusted from the instrument board and locked in position at the same point with a key. Monarch, Handy Chicago and Hoof make governors that are more easily and quickly adjusted as a result of the instrument board control.

The most recently developed engine accessory is the gasoline to fuel oil convertor unit. In most cases the unit is so constructed that the engine can be started on gasoline and operated on this volatile fuel until it is warm and then either by manual or automatic control the fuel feed is switched over to the fuel oil.

Operating on fuel oil requires maintenance of a constant temperature. The Evans Appliance unit uses glycerine as a medium of heat exchange to maintain temperature at the air intake and the glycerine takes its heat from 162 sq. in. of U tubes which carry exhaust gases. The American Control converter involves the changing of the manifold to take advantage of the low-priced fuel.

TRACTION IS IMPORTANT

Eight out of ten wheels *have* traction on the Warford 8-wheel drive 10-wheel truck—and your service brakes are applied to *all* of those 10 wheels.

Traction to start—snow, ice, sleet, mud, sand—or any place where the going is tough—and Warford tires are strangers to chains.

Brakes to stop—without danger—on slippery hills and icy pavements.

Three axles—10 wheels—10 tires to carry that heavy load over the best and the worst roads you have—and always under control.

The new Ford V-8 heavy duty truck motor—backed up by the usable emergency gear ratios in the Warford Super-Auxiliary Transmission and the traction offered by THE 8-WHEEL DRIVE WARFORD 10 WHEELER make a heavy-duty truck for 10 tons capacity—adding new and greater force to Warford's slogan:

MORE TONS **MORE MILES** **LESS COST**

Warford V-8 eight wheel drive multi-wheelers equipped with Warford heavy duty transmissions—dual brake boosters—ten 32 x 6 tires.

Chassis Weight	5855 Lbs.
Saddle and Tank	3325 Lbs.
Payload (2470 Gallons Heavy Oil)	17290 Lbs.
	26470 Lbs.

Write Us For Complete Information

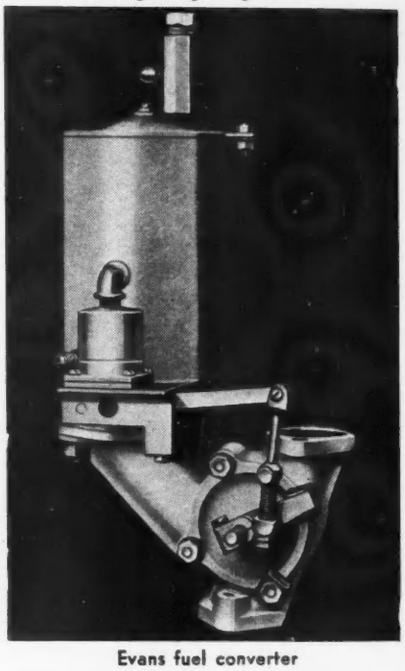
THE WARFORD CORPORATION
44 WHITEHALL STREET NEW YORK, N. Y.

Carburetors

DO not be fooled by the apparent emphasis on heavy fuel consuming engines and accessories into believing that the people concerned with gasoline consuming engines are standing idly by. The new down-draft carburetors have been improved continuously to give smoother performance and more efficient result from the fuel. The Zenith 20 series is one of the newer carburetors which combine features impossible to get in a carburetor a few years ago.

Hoof governor dash control

Chicago engine governor



Evans fuel converter

American Control oil converter

TRUCKS HUNT BLACK GOLD

"Ready for the shot?" The operator waits for the signal as he stands alongside one of the Goodrich-equipped trucks used to haul explosives.

SCOUR GLOBE FOR OIL
HAUL DYNAMITE ON TIRE-KILLING JOB

Hunting new oil fields with the aid of dynamite, huge drills and precision instruments, caravans of trucks travel country where rubber tires never touched ground before.

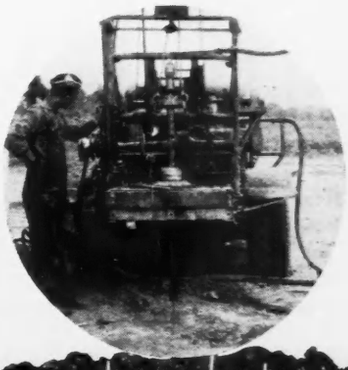
These are the trucks of the Seismograph Service Corporation of Tulsa, Okla. With six vehicles in a group and 22 groups scattered throughout the world, they go wherever there may be oil. Roads follow later. Some of the trucks carry heavy machinery, some the most delicate of instruments, others dangerous cargoes of dynamite. All depend for safety on Goodrich Triple Protected Silvertowns.

SILVERTOWNS FIRST CHOICE

Few truckers have service conditions as severe as these. But all truckers can get the same dependable tires which this company uses here and abroad for their trucks in Poland, Rumania, Hungary, Canada and elsewhere. The tires that stand up in this torturing off-the-road service will do your job better, too. Goodrich Silvertowns are first choice on the world's toughest hauls. It's because they are Triple Protected against sidewall breaks and blow-outs. A new invention actually checks 80% of premature failures! Silvertowns have this extra protection built into the heart of the tire:

1. **PLYFLEX**—distributes stresses throughout the tire—prevents ply separation—checks local weakness.
2. **PLY-LOCK**—protects the tire from breaks caused by short plies tearing loose above the bead.
3. **100% FULL-FLOATING CORD**—eliminates cross cords from *all* plies—reduces heat in the tire 12%.

This means freedom from road delays, a slash in repair bills, much greater mileage. Why not follow the lead of the truckers with the toughest jobs? Use Triple Protected Silvertowns on every wheel. They cost no more—they save plenty. Ask any Goodrich dealer for proof. The B.F. Goodrich Co., Akron, Ohio.



This heavy drill must be moved over rough country miles from any road. It gets there safely on Goodrich Silvertowns.

●

In Seismographing, a hole is drilled from 30 to 200 feet deep, loaded with dynamite and the charge fired. Instruments record the effects of the blast, reveal the earth's underground structure.

Goodrich *Triple Protected* **Silvertowns**

SPECIFY THESE NEW SILVERTOWN TIRES FOR TRUCKS AND BUSES

NEWS

(CONTINUED FROM PAGE 80)

Cole, James Upped by Studebaker

Roy E. Cole has been appointed vice-president in charge of engineering and of William S. James as chief engineer of the Studebaker Corp.

Goodrich Ups Three

The B. F. Goodrich Co. has appointed J. E. Powers manager of the New York district; E. P. Weckesser succeeds Mr. Powers as Newark, N. J., district manager; R. J. Devereaux becomes Buffalo district manager.

GMT Gets 300 Truck Order

New York City's department of Sanitation has ordered 300 cab-forward heavy-duty trucks from General Motors Truck Co., for use in garbage disposal. The order amounts to $1,590,000.

Drake Joins Pacific Highway Transport

H. W. Drake, formerly service engineer for A. F. Blangy Motor Co., Seattle, is now superintendent of equipment for Pacific Highway Transport, Tacoma, Wash., assistant to General Manager L. L. Lamb.

Rugg in Detroit

H. M. Rugg, automotive engineer for the Pennsylvania Grade Crude Oil Association, will be in charge of the company's new offices in the General Motor Building, Detroit.

Williams Goes West

Jay H. Williams, assistant director of the National Highway Users Conference, Washington, D. C., is making a Western trip during November, meeting with highway users and truck operators at Billings, Salt Lake City, Boise, Portland, Seattle, San Francisco, Los Angeles, and Phoenix.

Pacific Freight Has 111 Diesels

The Pacific Freight Lines has acquired 10 new Sterling chassis, equipped with Cummins Diesels. This brings their fleet of Diesel trucks up to 111 units, making them the largest Diesel fleet operator in this country.

Burgess Acquires Thordarson

Burgess Battery Co. of Chicago, announces the purchase of the controlling interest in the Thordarson Electric Mfg. Co., Chicago, manufacturers of transformers for the radio and neon sign industry.

Newton Joins Frisco Street Railway

L. V. Newton, formerly transportation manager of the Byllesby Engineering and Management Corp., Chicago, is now vice-president of the Market Street Railway Co., San Francisco.

Weatherhead's New Plant

The Weatherhead Co. of Cleveland recently announced the purchase of the former Hupmobile plant in that city.

The group consists of two monitor type buildings, a four story factory and a five story office building. These new quarters have approximately half million square feet of floor space, giving the company greatly increased general and factory office facilities.

AC Opens Offices

New regional sales offices were opened on November 1 at Atlanta, Ga., and Kansas City, Mo., of the AC Spark Plug division of General Motors. The Atlanta region will be in charge of Mr. James F. Kingsley. The Kansas City region will be in charge of Trent R. Middlekauff.

ICC Policy Decision

In a unanimous opinion, the Interstate Commerce Commission refused to approve an application of the Pennsylvania Trucking Lines, Inc., to acquire control of Barker Motor Freight, Inc., which operates in Ohio, Mich., W. Va., Ind., Penn., and Ky. The applicant is controlled by the American Contract and Truck Co., a holding company owned by Pennsylvania Railroad.

Arriving is as important as starting!

"How many miles to a gallon of gas?" "How many miles to a gallon of oil?"

In the operation of any motor vehicle the answers to these important questions tell whether the motor is performing efficiently.

Of equally vital importance are the many other parts of the vehicle which cannot be so easily checked.

For example:

"How many miles to a rear axle?" "How many miles to a set of springs?"

There is only one place where answers to *these* questions can be gotten . . . the maintenance shop.

This brings up a final and very important question . . . "How can every haul be made a profitable one?"

By making careful inspection, immediate adjustment or repair and thorough lubrication, the hard and fast rules of the maintenance garage.

Rapid Transit Companies, Contract Haulers, Chain Store Fleet Owners and Highway Departments *must* keep their equipment on the road. They are using JOYCE TRUCK LIFTS to make sure that their maintenance men have the proper facilities for keeping their vehicles in perfect running order.

For lifting 8,000 or 40,000 lbs. JOYCE has an Air or Electrically operated Hydraulic Lift for the purpose. The Joyce-Cridland Co., 532 Findlay Street, Dayton, Ohio.

JOYCE

JOYCE LIFTS

BUILDERS OF LIFTING DEVICES SINCE 1873

for SIMPLICITY ACCESSIBILITY ADAPTABILITY LOW MAINTENANCE

Specify BLOOD BROTHERS

UNIVERSAL JOINTS

Whether you operate one truck or fifty, every time you avoid unnecessary costs you add to your operating profit. The surest way to keep maintenance down to a minimum is to specify parts and equipment which have a record of efficient, uninterrupted operation even under the hardest kind of punishment.

You can check the uninterrupted, low cost performance established by trucks equipped with BLOOD UNIVERSAL JOINTS, from operators whose names we will gladly furnish upon request.

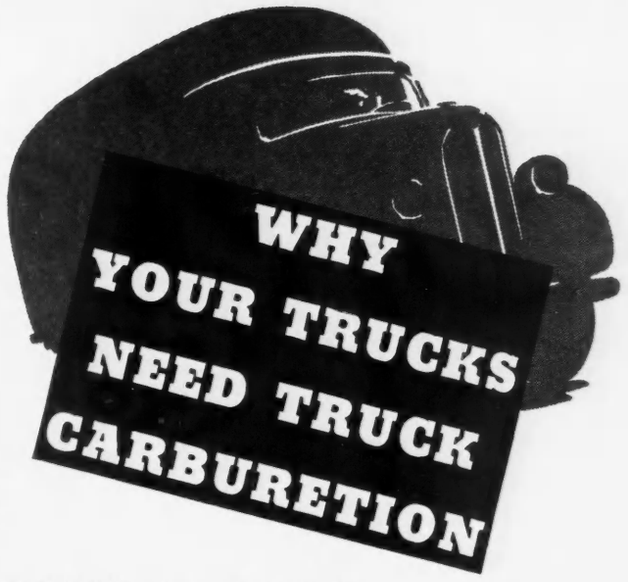
The New "SERIES N" Needle Bearing Joints

4N—5N—6N—and 7N offer you a fundamentally correct design, sealed lubrication, wide angularity and ample capacity for the heaviest loads. True running assemblies produce normal wear evenly distributed over the entire bearing area and insure free-running, low cost efficient operation.

Yoke design is such that plain yokes can be used as easily as flanges, yokes and companions at a saving in cost. Flanges, yokes and companions will be furnished, however, when required.

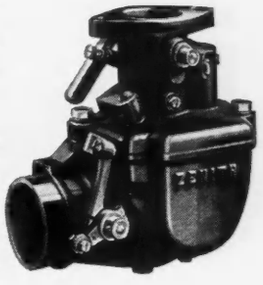
Whether for replacement or as original equipment, specify BLOOD BROTHERS JOINTS as the surest means of avoiding service interruptions and unnecessary operating cost items.

BLOOD BROTHERS MACHINE COMPANY
ALLEGAN MICHIGAN



WHY YOUR TRUCKS NEED TRUCK CARBURETION

MODERN trucks have just got to be tough—because they have extraordinarily tough jobs to do . . . heavy loads to pull up hill and down—through complex city traffic—over bad roads as well as good. So their insides must be built "to take it"—especially their carburetors.



Truck engineers recognize this. Thus, they equip their trucks at the factory with Zenith Carburetors! Here's why: Zenith Carburetors are ruggedly constructed. Their efficiency has been perfected so that it extends through the whole power range—from idling to open throttle. Engineers know that at any speed Zenith's power jet system always assures full power.

That's why we say—install Zenith Carburetors in your older trucks, and specify them in the new ones you buy. More economical gasoline mileage, stepped-up traffic performance, vastly increased power will be the inevitable result of a Zenith installation.

One more suggestion: Install the sensational Zenith heavy-duty truck Fuel Filter. It is not just another screen. It provides engine protection at the lowest cost on record. Can be installed quickly—and cleaned in a few moments. Requires no cartridge—no packing renewal. Send coupon below for full facts and details.

ZENITH CARBURETORS

Built for Permanence — Calibrated for Performance

ZENITH CARBURETOR COMPANY
(Subsidiary of Bendix Aviation Corporation)
696 Hart Avenue, Dept. C-11, Detroit, Michigan
Send full particulars regarding Zenith Fuel Filters and Zenith Carburetors for following engines:

Make and model of vehicle.....
Name.....
Street Address.....
City..... State.....
Nature of Business.....

PRINTED IN U.S.A.

Shop Equipment

(CONTINUED FROM PAGE 35)

incorporates a method of gas generation from cakes of Carbic (calcium carbide briquets) basically similar to that employed in Carbic flood lights.

It has been designed to provide a simple, portable generator which can be used with any make of medium-pressure oxy-acetylene welding or cutting equipment, and which will supply a wide range of welding and cutting operations.

Gear Flusher

THE Aro Equipment Corp., Bryan, O., has developed an efficient gear flusher to retail at $9 and will place this equipment on display for the first time at the Automotive Equipment Service Show.

This sturdily built light weight flusher, attractively finished in Aro red, consists of a pressed-steel spherical container, an operating valve and a service hose with nozzle. It may be used with any air hose on an air pressure of 100 to 175 lb. per sq. in.

In use, the Aro flusher is held in the right hand. The operating valve serves as a handle. No slow draining process is required and the entire flushing operation takes but a few minutes.

Fuel Meter

THE Deady Fuel Meter made by the Deady Fuel Meter Co., 12 East Norman Ave., Dayton, O., is for mounting on trucks either permanently or temporarily. The purpose of the meter is to measure the amount of fuel that the truck is using. It will operate on either a six or 12 volt system. It is 9 in. by 5 in. square and records from 1/16 gal. to 9999 gal. It is said to be extremely valuable in checking on engine efficiency, fuel selection and driver honesty.

Electric Sander

THE Sterling Products Co., Detroit, Mich., presents a reciprocating electric sanding and polishing machine.

This machine is driven by electric motor through a flexible shaft.

The sanding action is reciprocal with 5/8 in. travel of the sanding pad, at speeds from 1750 to 2800 oscillations per minute, depending upon the type of work that is to be performed.

Flexible rollers of special composition rubber and fabric are attached by pins to the sander bloc, in addition special pads varying in flexibility are available. Due to this construction feature, there is no restriction in the movement of the block and the machine is applicable to curved and flat surfaces.

New Walker Jacks

WALKER MFG. CO., Racine, Wis., announces three new products for use in repair shops:

Lift-A-Car is a lightweight, mechanical jack, known as No. 714. Power raise is from 3 5/8 in. to 18 3/8 in. Rated capacity is 1-ton. It is priced at $16.75.

Roll-A-Car is a lightweight mechanical jack. This jack is known as No.

743. The handle operates in any one of three positions. The jack has a raise

(TURN TO PAGE 158, PLEASE)

STOP
FUEL LINE Breakage
ATTENTION SUPERINTENDENTS:
Stay off the boss' carpet by putting fuel lines in your buses whose service you can guarantee.
Weatherhead FLEXIBLE FUEL LINES
bring your buses back. Others will too—*if* they don't break on the road.
THE WEATHERHEAD COMPANY
632-714 Frankfort Ave., Cleveland, O.
To KEEP BUSES Going
GO

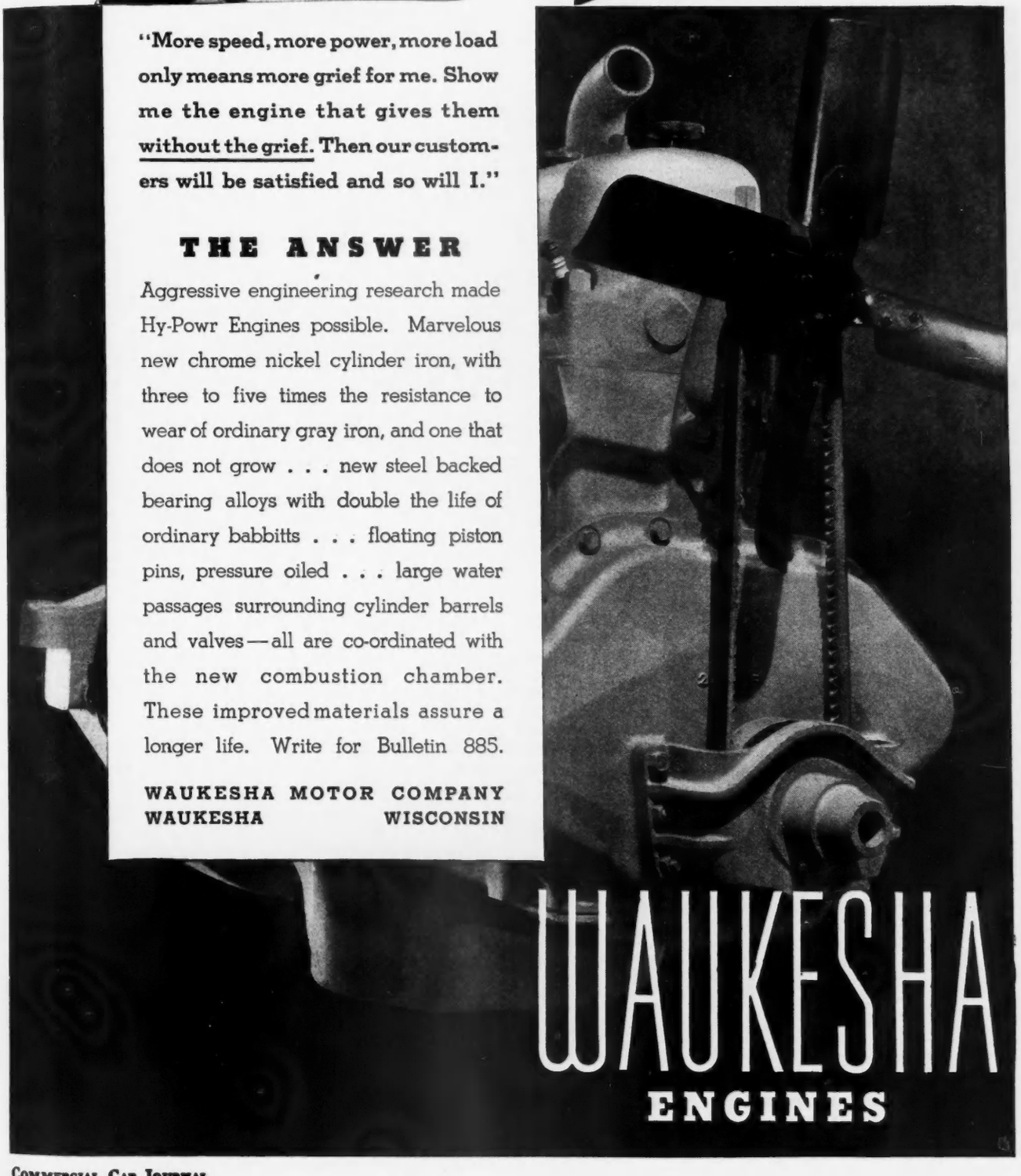
YOU SERVICE MANAGERS SAY: *Show me*

"More speed, more power, more load only means more grief for me. Show me the engine that gives them without the grief. Then our customers will be satisfied and so will I."

THE ANSWER

Aggressive engineering research made Hy-Powr Engines possible. Marvelous new chrome nickel cylinder iron, with three to five times the resistance to wear of ordinary gray iron, and one that does not grow . . . new steel backed bearing alloys with double the life of ordinary babbitts . . . floating piston pins, pressure oiled . . . large water passages surrounding cylinder barrels and valves—all are co-ordinated with the new combustion chamber. These improved materials assure a longer life. Write for Bulletin 885.

WAUKESHA MOTOR COMPANY
WAUKESHA WISCONSIN



WAUKESHA
ENGINES

Shop Equipment

(CONTINUED FROM PAGE 156)

up to 16⅜ in. and goes down to 3⅞ in. Rated capacity 2-tons. Sells for $30.

The senior Roll-A-Car for all but heavy truck service. Power raise is from 3¾ in. to 24½ in. This hydraulic, No. 785, has a turning knob at the top of the handle which regulates the speed of lowering and also pulls out and locks the handle in any one of three operating positions. The jack has dual pumps—a speed pump and power pump. The rated capacity is 3¾-tons and an automatic safety valve protects jack load and operator. It opens when the jack is overloaded or handle is operated after jack has reached its full height.

Priced to sell for $55.00. Prices on all three products are slightly higher west of Denver and in Canada.

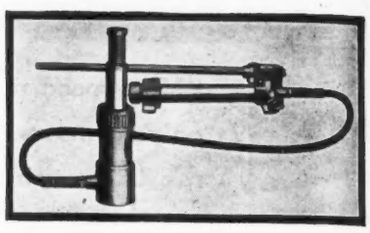
Spray Gun Air Cap

THE DeVilbiss Co., Toledo, Ohio, has developed a new twin jet type suction feed air cap, No. 37, for use on their type CL paint-spray gun. The type CL is a small, light-weight gun recommended for medium requirements in product finishing, automobile and furniture refinishing, and other painting and finishing requirements.

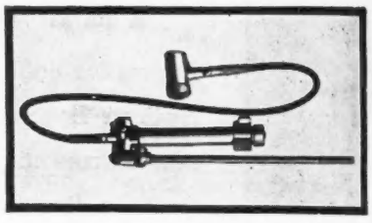
The new cap is specially designed for use in the higher range of air pressures ranging from 45 to 75 lb.

Porto-Power Units

BLACKHAWK MFG. CO., Milwaukee, Wis., has anounced two additions to its Porto-Power line, one being a 7-ton short ram for close work on bodies,



frames and fenders, and the other a 20-ton ram unit for heavy duty work on frames, axles, chassis and general shop



work. The short ram, Model S-66, has an overall length, collapsed, of 4½ in., and the plunger travels 2½ in. The 20-ton Porto-Power Unit has a collapsed height of 10¼ in., with a lift of 4½ in.

Spray Gun Adapter

THE Sherwin-Williams Co., Cleveland, Ohio, has anounced the Cunningham spray gun adapter which will fit most makes of spray guns. With this adapter it is possible to use the Sherwin-Williams quart paint can as a spray cup with resulting savings in time and material. The adapter attaches to the gun in the same way as a spray cup and then it fits snugly over opening in the can and is locked into place with two clips.

Alemite Magazine Gun

A NEW Magazine Gun has been developed by the Alemite division of Stewart-Warner Corp., Chicago, Ill.

One air motor head and five or more lubricant magazines form a complete power-operated gun set. Magazines can be interchanged without loss of lubricant or air. They are available with low or high pressure piston, maroon or uncolored cylinders; and each is a complete unit, detached in its entirety

(TURN TO PAGE 160, PLEASE)

Gatke

FULL COVERAGE LUG TYPE
U. S. Pat. No. 2016280

HEAVY DUTY WOVEN

SMOOTH TYPE DRILLED

RIVET ON TYPE

CONTINUOUS (ONE PIECE) BLOCK
FOR INTERNAL EXPANDING BRAKES

BRAKE BLOCKS and LININGS

for Popular and Heavy Duty Trucks, Trailers and Buses

GATKE Heavy Duty Brake Blocks and Linings meet the most exacting service requirements of many of the largest fleet owners from coast to coast.

Whether you operate popular or heavy Duty Trucks, Trailers or Buses, Gatke Brake Blocks and Linings will furnish that extra holding power that assures safety and economy for every mile of operation.

A trial set of blocks or linings recommended for the particular brake may prove that your

BRAKE PROBLEMS ARE SIMPLIFIED

★

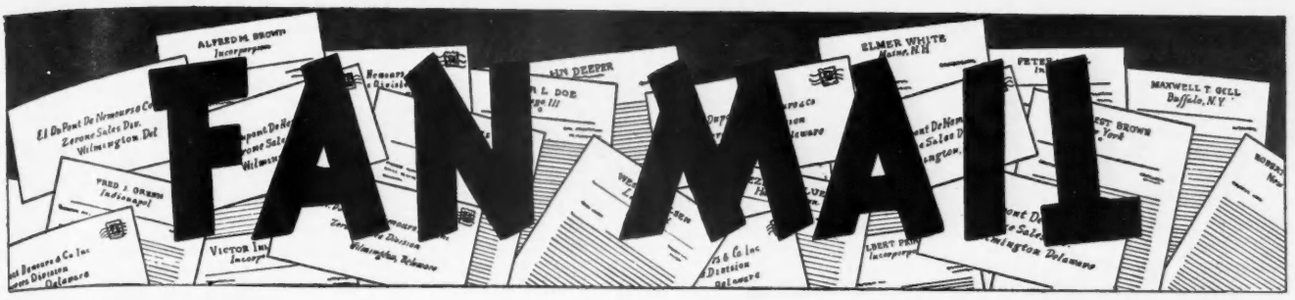
LARGE or small
Gatke Stops Them All

★

For information ask the Gatke Jobber or write to

GATKE CORPORATION

228 N. LA SALLE STREET • CHICAGO, ILLINOIS



"ZERONE" *speaks for itself...and* "ZERONE" *users speak for themselves*

HERE are a few of the many letters received from fleet operators who have reduced their winter operating costs with "Zerone" anti-freeze. And here's why "Zerone" can't be beaten for season-long economy:

An amazing laboratory test proved that "Zerone" can keep water from freezing, even at 215° below zero! Of course winter never gets as cold as that, but with "Zerone" in your equipment, you won't have to worry in the coldest weather we *will* have. "Zerone" is so effective that less is needed, and the rate of evaporation is low. In a clean cooling system, "Zerone" also prevents rust and actually improves engine performance all year round.

Why take a chance on expensive repairs and delays when you can get complete, low-cost protection with this reliable du Pont anti-freeze? "Zerone" is sold in sealed, tamper-proof gallon and quart cans or in fifty-four-gallon drums. E. I. du Pont de Nemours & Co., Inc., "Zerone" Sales, Wilmington, Delaware.

DU PONT

"We have been using your anti-freeze preparation called 'Zerone' in our fleet of trucks during the winter months for the past four years, and have always found same satisfactory, both in cost and operation. We have noticed that your product does not evaporate nearly as fast as some of the other preparations we have used. We cheerfully recommend 'Zerone' to those who desire a commodity that will keep a motor from freezing in extremely cold weather."

DOBBINS COAL COMPANY, INC.
NEW YORK

"Our experience with the use of 'Zerone' anti-rust anti-freeze in our seventy-five units during the past two years has been highly satisfactory. We are especially attracted by the economic factor in actual service and the protection against freezing 'Zerone' affords."

LINCOLN-BOYLE ICE COMPANY
CHICAGO

"We have used 'Zerone' anti-rust anti-freeze solution in about twenty-five units and found it very economical and efficient. It has given us full protection against cold at a minimum expense and we can recommend it highly."

WERNER BROS.—KENNELLY CO.
CHICAGO

"The Du Pont Laboratories should be complimented upon the development of 'Zerone' anti-rust anti-freeze. We used this product in our equipment last season and found it economical and efficient."

FOLTIS-FISCHER CORPORATION
NEW YORK

EVEN AT 215° BELOW "ZERONE" PROTECTS

Shop Equipment

(CONTINUED FROM PAGE 158)

from the motor. The air valve is simple and fool proof.

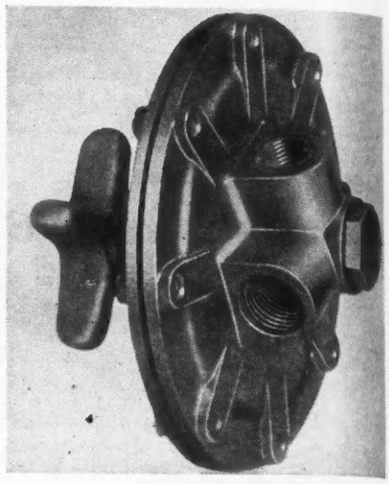
The air motor weighs just 2 lb. 10 oz.; the magazine, 4 lb. 10 oz. with a capacity of 1 lb. At 150 lb. air pressure the lubricant delivery of the high pressure magazine is approximately 5 oz. per minute; about 10 oz. for the low pressure magazine. The power developed, in ratio to the air pressure used, is 40 to 1 in the case of the high pressure magazine, 20 to 1 for the low pressure.

Air Regulator

THE DeVilbiss Co., Toledo, Ohio, announces a new low capacity regulator, the Type HFS, designed for the sensitive regulation of air pressures below 30 lb.

The 4-in. diameter diaphragm of this new regulator provides a sensitivity approximately six times as great as that of the standard type Regulator, the effective area of whose diaphragm is generally only 1½ in. in diameter.

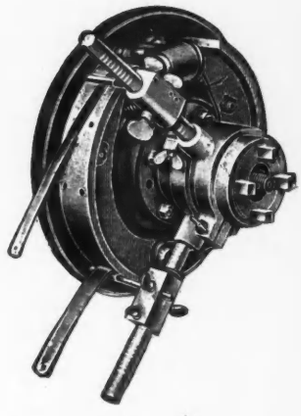
Regulated air pressure on the new type HFS Regulator can be graduated up to 30 lb. with but one ounce variation for each 10 lb. variation of main line pressure. That is, a variance of



40 lb. in main line pressure will cause only four ounce variation in the regulated air pressure.

Brake Micro-Gauge

A BRAKE Micro-gauge is being offered by the Wagner Electric Corp., St. Louis, Mo. This tool fits every passenger car



and truck and enables the mechanic to adjust the heel and toe of the brake shoe at the same time. It detects bent steering knuckles and bent axles, checks taper, concentricity and out of roundness of brake drums and determines actual thickness of lining necessary. Single arm unit is $18.80 and is for axles to 1¾ in. OD and brake drums to 17½ in.

Thermostat Tester

TWO new pieces of equipment for winter servicing have been made available by the anti-freeze division of Publicker, Inc., Phila., Pa. The first of these is a Thermo-meter, designed by Publicker, and guaranteed to be accurate within 2 deg. F. between 120 deg. F. and 180

(TURN TO PAGE 162, PLEASE)

The Accepted Standard

AUSTIN

FIFTH WHEEL

The RUBB-AIR CUSHIONED FULL FLOATING MOUNTING is available only in the AUSTIN. Other outstanding features are—Automatic safety lever lock which prevents accidental uncoupling—Alloy steel drop forged king pin jaw members—Pressure lubrication to all bearings, including machined plate surface—Interchangeability with all standard king pins.

Specify the AUSTIN FIFTH WHEEL and join the thousands of users who have learned these features have increased the earning ability of their equipment by insuring constant trouble free service and lower maintenance costs.

In addition to Fifth Wheels, AUSTIN offers a complete line of Landing Gears, Pintle Hooks, Fifth Wheel Mounting Plates, King Pins and various Trailer Castings.

Write for further particulars

AUSTIN TRAILER EQUIPMENT COMPANY

Muskegon, Michigan

BORG-WARNER...BORG-WARNER

BORG & BECK CLUTCH · THE STANDARD ·

BORG-WARNER...BORG-WARNER

UP TO A STANDARD

In this industry, where change comes rapidly, and quality specifications are high, Borg & Beck continues to forge ahead with better and still better clutches. The reason for our steady growth, we believe, lies in our policy of building up to a standard—not down to a price.

Borg & Beck clutches have earned a high reputation because we see to it, here, that they can be "installed and then forgotten."

Every Borg & Beck clutch passes exacting tests for balance, uniformity and precision. When the fine electric line of this new balance test machine shows straight another clutch has passed with flying colors—and another new car will have smoother performance.

• BORG & BECK DIVISION •

BORG-WARNER CORPORATION
CHICAGO, ILLINOIS

*New Low Prices**

HEIN-WERNER 7 TON CAPACITY HYDRAULIC JACK

* $11.75 WEST COAST $12.70

PERFORMANCE proves it is *BUILT RIGHT*

QUICK, EASY SALES prove it is *PRICED RIGHT*

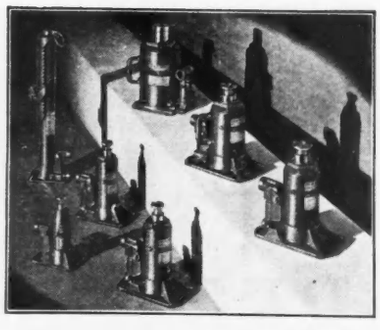
It is no wonder that this 7 ton capacity hydraulic jack is so popular. It is compact, sturdy and dependable, unmatched for severe service—yet priced so low that it costs little more than others ask for ordinary passenger car and light truck jacks. Skeptics said it couldn't be done—but Hein-Werner has done it—and will continue to set the pace in 1937.

ALL H-W JACKS ARE TESTED AT 1½ TIMES THEIR RATED CAPACITY . . .

This Model E-7.9A, like all others in this complete line, is an unmatched value. Low-9" . . . Lift-6¼" . . . Extension-4⅜" . . . High-19⅝" . . . Weight-28½ lbs. . . . Dealer price $11.75 (West Coast $12.70).

A Complete Line

Other models in this line include the "Bullet" Model, 1½ ton capacity at $2.80 (West Coast $3.10) . . . Light Truck Special, 2 ton model, $4.15 (West Coast $4.55) . . . For light trucks, 3 ton models at $6.95 (West Coast $7.45) . . . 5 ton models $8.95 (West Coast $9.60) . . . For heavy trucks, buses and shop use—12 ton models $17.50 (West Coast $18.50) . . . 20 ton models $30.00 (West Coast $31.00).—and for modern passenger cars, our new BUMPER-LIFT Model at a new low price of $4.95 (West Coast $5.65) . . . Above prices net to dealer.



FEW MODELS ENGINEERED TO DO THE WORK OF MANY

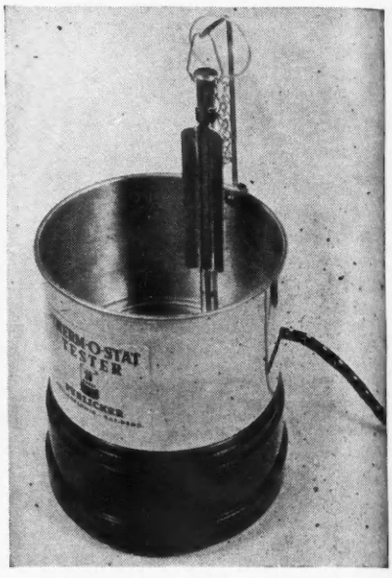
HEIN-WERNER hydraulic JACKS

HEIN-WERNER MOTOR PARTS CORP.
Waukesha, Wisconsin

Shop Equipment

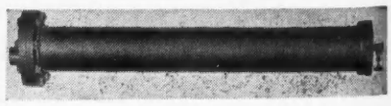
(CONTINUED FROM PAGE 160)

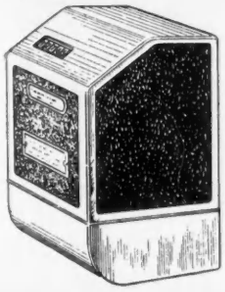
deg. F. It is equipped with a length of light chain and a ring clip to permit insertion in the top tank of a radiator to obtain a temperature reading on units without dash heat indicators. The Thermo-meter is used in conjunction with the Publicker Thermostat Tester. This is durably made of non-ferrous metal, contains a heat unit and provides a modern method for arriving at the accurate "break opening" and "full opening" points of the thermostat. To operate, the thermostat is placed in the water filled container, the Thermo-meter is hung in position, with the protected bulb immersed, and the tester is plugged in the lighting circuit. Then by observing the thermostat and Thermo-meter the points at which the thermostat operates can be accurately determined. As a further reference, a capacity chart which gives the correct opening points of the standard equipment thermostats is used.



Air Line Condenser

THE DeVilbiss Co., Toledo, Ohio, announces their new improved Extra Heavy Duty Condenser, Type HP-504-2. This new Condenser effectively removes oil and water, which finds its way into the air line, by a baffle arrangement within the Condenser and pair of filter pads conveniently located in such a way that they can be removed and replaced without disconnecting the Condenser from the air line. The Con-





DEADY
FUEL METER ECONOMIZES

Tells which gas gives best mileage, proper speed to drive, when to overhaul, if job was done right, who is HONEST and efficient, and other information essential to getting best profits and lowest costs; send for information.

THE DEADY FUEL METER CO.
12 E. Norman Ave. Dayton, O.

ALGOMA

offers the two finest plywoods for truck body construction and upkeep.

ALGOMALOID —the finest of plywoods; selected veneers, resin glue bond; in panels of any desired length, widths up to twelve feet.

ALGOMETL —metal-faced plywood for side, end panels and doors; stronger than steel of equal weight, lighter than any other material of equal strength.

Send for the Algoma "Bag of Samples"

— TECHNICAL DIVISION —
ALGOMA PLYWOOD & VENEER COMPANY
BUILDERS BUILDING - 228 NORTH LA SALLE STREET - CHICAGO, ILL.
FACTORY, ALGOMA, WISCONSIN

HOOF
DASH-CONTROL GOVERNOR
THE MOST SENSATIONAL SAFETY ACHIEVEMENT OF 1937.

Wire, 'phone, or write for details now.

HOOF PRODUCTS CO.
162 No. Franklin St., Chicago, Illinois

JONES PORTABLE TACHOMETER

The world's largest operators of commercial vehicles use Jones Portable Tachometers to check engine speeds, for tune-ups, and setting governors, etc. Here are a few: Standard Oil Co., of La., N. J., N. Y.; Shell Petroleum Co., Atlantic Refining Company, Tidewater Oil Company, Keeshin Motor Express, Mack Trucks, Brockway, U. S. Navy.

Direct, instantaneous reading.

JONES - MOTROLA - NEW YORK
450 WHITLOCK AVENUE

denser is recommended for efficient operation at a maximum air delivery volume of 75 cu. ft. per minute or less.

The Condenser is 4 ft. 8 in. long, has a tube diameter of 6 in., takes a 2-in. pipe thread on inlet and outlet tubes, and has a net weight of 140 lb.

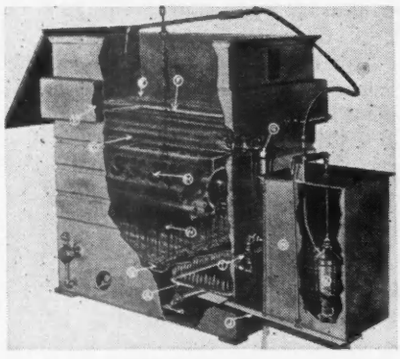
Sioux Valve Cabinet

THE No. 677 Sioux Valve Service Cabinet made by Albertson and Co., Sioux City, Iowa, is mounted on hard rubber wheels and is a complete carriage for

valve conditioning tools. There is a double electric outlet on the back of the steel cabinet. Your own assortment of valve tools can be kept in the cabinet or mounted on the top which provides a surface of 30½ in. by 20 in.

Degreasing Machine

CIRCO PRODUCTS CO., 3088 W. 106th Street, Cleveland, make the Rex degreasing machine which uses Perm-A-Clor solvent. The solvent used in the



machine may be used over and over as the machine is devised to separate the dirt and grease from the solvent. Degreasing for most parts requires only a few minutes.

Four machines are available in sizes ranging from 15 in. wide, 19 in. long and 35 in. high to 34½ in. wide, 74½ in. long and 60 in. high. They may be operated by gas, steam or electric medi-

(Turn to Page 164, Please)

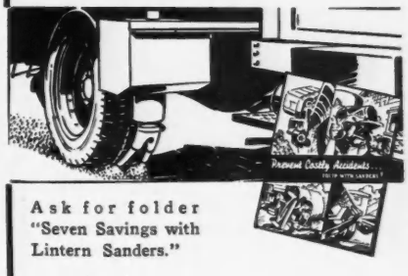
How to Cut WINTER COSTS

WHEN trucks are equipped with Lintern Sanders, you need chains less frequently and your drivers save a lot of time in putting them on and taking them off.

Yet the biggest saving is your protection against skids. For with Lintern Sanders you *carry your own traction.*

The cost is small—the savings great!

LINTERN JUNIOR SANDERS for salesmen's cars and light delivery trucks. Ask for literature.



Ask for folder "Seven Savings with Lintern Sanders."

Lintern SANDERS

THE LINTERN CORPORATION
7960 Lorain Ave. Cleveland, Ohio

THE ROBINSON . . . . .
UNIVERSAL COUPLING HOLDER

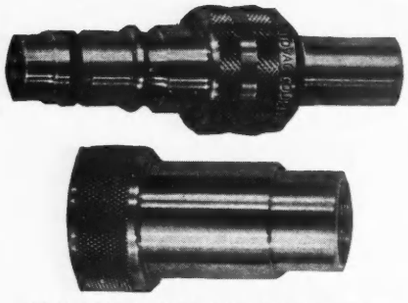
- HOLDS SECURELY
- SUPPORTS HOSE
- SEALS FROM DIRT

- Fits all standard type couplings. . . . Protects male coupling from damage which destroys brake efficiency.

$1.25 LIST PRICE

THE ROBINSON AUTOVAC COUPLER . . . . .

Connected . . . *Autovac* is fully open! Disconnected . . . *Autovac* is tightly closed! No valve to turn off . . . nothing left to chance. Saves time and money. Autovac protects hose lines and mechanism from water and dirt . . . it's automatically sealed when not in use.



RELIABLE MACHINE SCREW CO.
NEWARK, NEW JERSEY

Sterling
DIESEL
MOTOR TRUCKS

ENDURANCE

Over half a million miles have been traveled by a number of Sterling Diesel trucks. Endurance-ability to "stand the gaff" is a built-in quality of every Sterling motor truck.

There is a Sterling to meet your specific requirements.

Write today.

STERLING MOTORS CORPORATION
MILWAUKEE, WISCONSIN

Shop Equipment

(CONTINUED FROM PAGE 163)

ums of heating. All may be thermostatically controlled.

Hydraulic Brake Tester

THE Bear Mfg. Co. introduces a new model hydraulic brake tester. Designed to register under actual road conditions, this new unit combines in one, means for making either quick

drive-on tests or hook-up tests for adjustment work. For making quick inspection tests, a vehicle is driven on the runways and brakes applied, which instantly registers their condition on the calibrated dials through the medium of movable platforms.

Tests can also be made with a special cable attachment to insure accurate adjustment. By this method test may be held for any length of time with brakes applied. Runways are only 4½ in. from floor. Bear Mfg. Co., Rock Island, Ill.

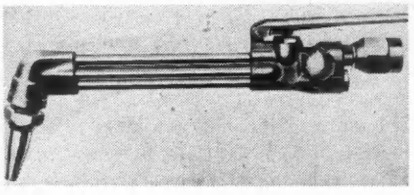
Light Truck Jack

ANTICIPATING the needs of operators of light trucks, Hein-Werner Motor Parts Corp. introduced a new 2-ton light truck special hydraulic jack for Ford, Chevrolet.

This new model will handle all light trucks. Model 2.95A is tested at 1½ times its rated capacity of 2 tons. Has 7-in. lift to total height of 16½ in. List price: $5.95. For complete information write the Hein-Werner Motor Parts Corp., Waukesha, Wis.

Oxweld Type CW-22

A NEW oxy-acetylene cutting attachment known as the Oxweld Type CW-22



has been announced by The Linde Air Products Co., 30 East 42nd Street, New

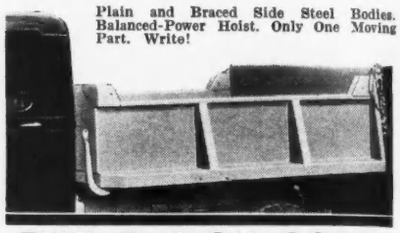
DOUBLE SAFETY · POSITIVE TRACTION · DOUBLE MILEAGE

McKay Multi-Grip Double-Bar-Reinforced Truck Chains

THE McKAY COMPANY
McKAY BLDG. PITTSBURGH, PA.

DUMP BODIES and HOISTS

Plain and Braced Side Steel Bodies. Balanced-Power Hoist. Only One Moving Part. Write!



THE BURCH CORP.
Dept. A– CRESTLINE, OHIO

TRADE MARK
NOC-OUT HOSE CLAMPS
THE HOSE CLAMP WITH THE THUMB SCREW

Standard equipment of the automotive industry. Adjustable - one size equals many. Quick tightening, perfect seal. At all Jobbers.

Pat. No. 1,382,813.

WITTEK MFG. CO.
4305 W. 24th Pl., Chicago, U. S. A.

BLACK & DECKER ELECTRIC VALVE SHOP

Rolls right up to the car with all tools necessary for a complete valve job

Ask your jobber, or write: The Black & Decker Mfg. Co., 732 Pennsylvania Ave., Towson, Md.

HANDY

World's Largest Manufacturer of

GOVERNORS
AIR CLEANERS
OIL FILTERS
OIL CONDITIONERS

HANDY GOVERNOR CORPN.
DETROIT

THE SPECIAL honeycomb construction of the Spongex Sponge Rubber Seat Cushion for Trucks and Buses, gives exceptional riding qualities.

The total air space within the cushion is so great, that there is no "packing" of the rubber under the severest shocks. Vibration is effectively absorbed, too. Spongex Cushions have no metal in them—removing all danger of injury. They can be counted on to last as long as the vehicle in which they are installed.

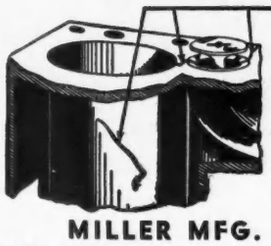
For Prices and Description Address Dept. C

SPONGE RUBBER PRODUCTS CO.
DERBY • CONNECTICUT

DOMINANT--IN ST. LOUIS

The Park Plaza
H. B. CALDWELL, Manager
Single from $3.50 Double from $5

A 30 MINUTE WELD IS FAST WORK IN ANY MAN'S TIME



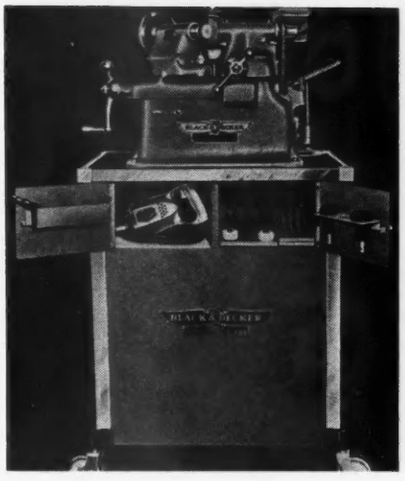
Wonderweld is the fast worker that seals cracked cylinder walls and valve ports.

MILLER MFG. CO.
1218 KAIGHN AVE., CAMDEN, N. J.

York City. This new cutting attachment handles light sheet metal as well as all but the heaviest work at speeds and efficiency equal to those of the full size cutting blowpipe. The Type CW-22 cutting attachment can be used on either the Oxweld Type W-17 or W-22 welding blowpipe handle.

Valve Grinding Unit

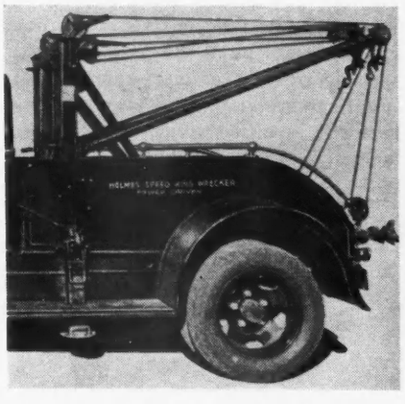
A PORTABLE valve grinding unit, complete with everything necessary to do a first class valve job, is the latest



development of Black & Decker Mfg. Co., Towson, Md. The valve refacing machine is mounted on a cabinet which contains an electric drill and valve seat conditioning equipment, and is wired for tools and lamp. A 20-ft. cable supplies current from the wall socket. Storage space is provided for hand tools, drills, spare parts, etc.

Wrecking Unit

THE new service unit consisting of Holmes Power Operated Speed King Wrecker and Service Body combines

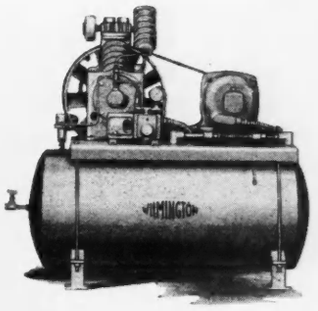


all features of the original Holmes Wreckers with many new improvements. The new structural steel frame gives a streamlined appearance and a 50 per cent increase in capacity. Power

(TURN TO PAGE 166, PLEASE)

WILMINGTON COMPRESSORS

Horizontal
Vertical
Single Stage
Two Stage



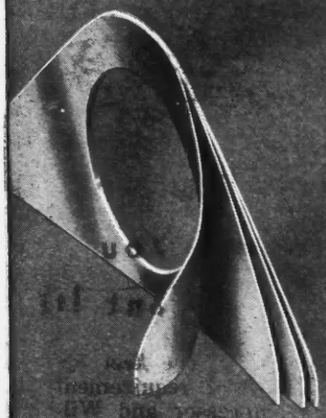
Always Ready When You Want It!

Reliability is the fleet operator's chief requirement of a compressor and Wilmingtons are dependable every day for years and years. When your trucks come in at night, you want the washing and greasing done at once; the tires checked; the dust blown off. With a Wilmington you get the work done without fail, thoroughly at low cost. Learn about the "extras" that are standard equipment on Wilmingtons: non-pulsating check valve; protected motor; simple valves; positive unloader. Ask for catalog.

The AUTO COMPRESSOR CO.
S. Mulberry St., Wilmington, Ohio

WEAVER
Lo-Hi-Draulic JACKS
in sizes for every need
Ask for Catalog "O"
WEAVER MANUFACTURING CO.
SPRINGFIELD, ILL.

I am your profit in bearing adjustment



I give you .002" adjustment in each lamination! No miking . . . no filing. Just p-e-e-l off .002" or more at a time.

I provide the precision required for modern bearings . . . quickly! I make service adjustments profitable!

LAMINATED SHIM COMPANY, INC.
MFRS.: LONG ISLAND CITY, N. Y.

LAMINUM

FEDERAL-MOGUL CORP.
DISTRIBUTORS: DETROIT, MICH.

Shop Equipment

(CONTINUED FROM PAGE 165)

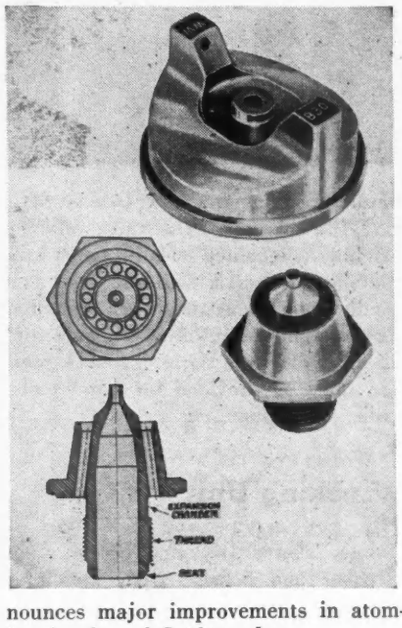
operation enables the most difficult jobs to be handled with greater speed. The unit is manufactured by the Ernest Holmes Co., Chattanooga, Tenn.

Flushing Gun

A NEW Blo-Hot flushing gun is being produced by the Firman L. Carswell Mfg. Co., Valley and McAlpine Sts., Kansas City, Kansas. The gun which is for flushing out transmissions, differentials, etc., delivers 400 deg. of heat together with 40 lb. per sq. in. pressure on atomized flushing oil. It may be attached to any standard air chuck and the air pressure on the piston automatically closes the electrical circuit so that the heating element begins to operate.

Spray Equipment

THE Paint Spray Equipment division of the Alexander Milburn Co., 1493 W. Baltimore St., Baltimore, Md., an-



nounces major improvements in atomizer heads and fluid nozzles.

Generous air passages, closely spaced, provide a large annular air supply to atomizer head resulting in a perfectly atomized spray. The internal tapered seat is finished to exacting

VOLT-O-MATIC GENERATOR

. . . Shoulders the Battery's Burden . . .

Write for booklet that tells how

UNITED AMERICAN BOSCH CORP.
SPRINGFIELD, MASS. New York, Chicago, Detroit

HUG

—the trucks that are "BUILT TO MEET A CONDITION"

THE HUG COMPANY
Highland • Illinois

Fleets keep moving

—when re-ringed with MOLIUM
The new economical postive oil control method.
Write for details
Simplex Products Corporation
3816 Kelley Ave., Cleveland, O.

SIMPLEX
MOLIUM PISTON RINGS

TOLEDO

VALVES • GUIDES • SPRINGS • KEYS
SEAT INSERTS • WATER PUMP PARTS
CHASSIS BOLTS AND BUSHINGS
TRYON SHACKLES
SILENT "U" SHACKLES
HARRIS SHACKLE BUSHINGS
ECCENTRIC TIE RODS • PISTONS
CHROME-PLATED PISTON PINS
Write for Catalogs

The Toledo Steel Products Co.
3304 SUMMIT STREET
TOLEDO, OHIO, U. S. A.

SPEED

Count the slow downs your drivers make per hour. Figure their cost in: Time lost—Driver fatigue—Oil and gas.

A Buell Air Horn insures your driver his right of way because of its power. A 12% to 15% faster Schedule is the record of large fleet owners.

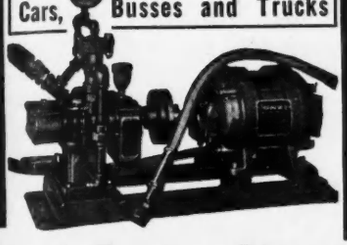
BUELL AIR HORNS
SOUND RANGE 1 TO 10 MILES
POWERFUL—DEPENDABLE—FOOLPROOF
Write for further information
BUELL MANUFACTURING COMPANY
2981 Cottage Grove Ave. Chicago, Illinois

SAFETY

Dangerous curves, hidden side roads, sleepy and inattentive drivers, closed car windows, radios, make a powerful signal a necessity.

One small accident avoided covers the cost of a Buell Air Horn.

The Economical Way to Clean Cars, Busses and Trucks



Wash Faster, Cleaner with *Speedwashing!*

WASH RACKS! GARAGES! MAKE more profit out of wash jobs. Handle more business without increasing overhead. Speedwashing does it for you. Investigate Rotawasher at once.

FLEETOWNERS! Reduce your washing costs. Keep your fleet in top looks for less money. Speedwashing is doing it for others. And you get speedwashing only with Rotawasher. Write for full details.

THE ROTAWASHER CORP.

Dept. CC, 118 E. St. Clair Ave.
CLEVELAND, OHIO

McCORD REFRIGERATION
—FUEL SYSTEM
FOR TRUCKS
REFRIGERATION
AT NO COST
—BY THE FUEL
THAT RUNS THE MOTOR

McCORD RADIATOR AND MFG. CO.
DETROIT

DEPENDABLE!
WINDOW-WIPER

If you want air-brake dependability, write to the Hays Corporation, Michigan City, Indiana, for literature describing this new husky wiper that slashes through clotted mud or snow with the 100-lb. kick of the air-brake supply behind it.

AIR-PUSH
WINDOW-WIPER

St. Paul
HYDRAULIC HOISTS and BODIES

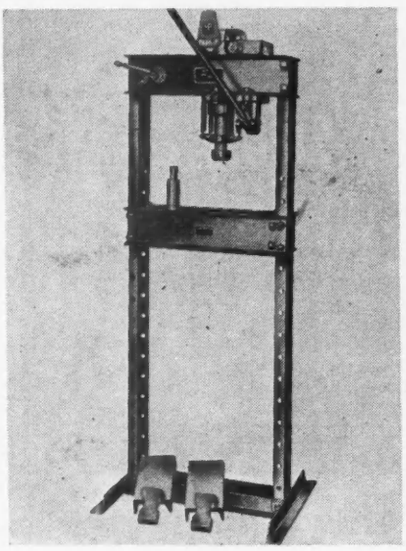
There's a St. Paul Hoist to fit every need. Distributors conveniently located in leading distributing centers . . . stocked and ready to make prompt shipments.

St. Paul Hydraulic Hoist Co.
2207 University Ave., Minneapolis, Minn.

specifications allowing the paint needle point to seat accurately and prevent dripping or spattering. One particular feature is that the nozzle seats on the base of the thread of the head which keeps paint or other material entirely out of the threads eliminating clogging.

Hydraulic Press

THE 25-ton hydraulic press by Lempco Products, Inc., Bedford, Ohio, is of entirely new design. The main cylinder,



oil reservoir and pump are cast integral and there is no outside piping whatever. The main feature is a new two-speed pump which affords a free ram travel of ½ in. per pump stroke; after the ram contacts the work, the pump automatically shifts into slow speed and high pressure where four or five strokes, "one handed" bring the pressure to the maximum of 25 tons at which point the safety valve is set to open, preventing overloading of the mechanism or the frame-work. Another feature is a new quick acting pressure release valve of our own design, affording the fastest ram return ever incorporated in any manually operated hydraulic press. The pressure gauge is also of new design, simple construction and proof against the usual risks of damage incidental to press work.

(Turn to Page 168, Please)

BRAKES?
1. Doubled Load Capacity
2. Tripled Lining Life
3. Permanently Equalized
with
LINDERMANS
A drum full of lining and the same pressure under every square inch.
Send for catalog 101-2c.
LINDERMAN DEVICES, Inc.
149 Broadway, New York, N. Y.

AMERICAN
Safety Fusees
NOW
Stand Anywhere

On the shoulder of a road, no matter how uneven, or on any pavement, your driver can set up one of the new American Fusees. The spike has been replaced by an integral folding tripod. Spread the wire legs and light up. Instant protection without hunting a "soft spot."

Also manufacture Fusees with spike end.

Burning times 10-20-30 minutes.

A bracket holding three Fusees in clips in the cab makes protection instantly reachable. Get one for each cab.

Write for circular and price sheet.

PAT PEND.
Folded

The American Railway Signal Co.
Fostoria, Ohio

THIS IS THE NEW VEL-VAC HAND CONTROL VALVE

NOW $11.75
Complete. With mounting bracket, gauge, and hose fittings.

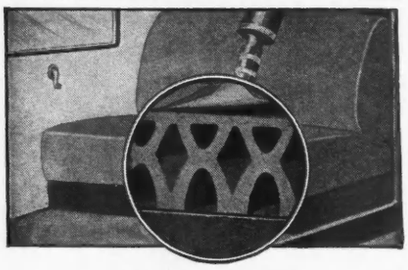
The V-33 De Luxe Model illustrated insures improved trailer brake control, calibrated braking progression, instantaneous application and release, hair trigger action matched with dependability. Write today for new Vel-Vac Manual on Power Brakes and accessories. It's free.

VACUUM POWER EQUIPMENT CO.
1646 W. Lafayette Blvd., Detroit, Mich.

You Can't Fool the Factories..
They know what's best for production and service. That's why 32 leading factories and thousands of service shops have adopted ECCENTRIC Valve Seat Grinding. You can't go wrong on service equipment if you follow the factories. Ask your Jobber.
O K'd

ECCENTRIC VALVE SEAT GRINDER

THORNTON
Dual Ratio Four Rear Wheel
DRIVE
FOR TRUCKS!
Is setting new records
THORNTON TANDEM CO.
Detroit



SEAT CUSHIONS

Owners who keep the closest check on *all* their truck operating costs are the most enthusiastic boosters for BLACK DIAMOND All-Rubber seat cushions and back rests, because their first cost is the last cost. They'll be good when the truck is worn out. Exceptionally comfortable, these patented All-Rubber cushions are safer, too, as they reduce road fatigue. Let us prove to you that BLACK DIAMOND Cushions will save you money. Write now, for complete facts.

KARPEX MANUFACTURING CO.
1424 E. 19th St., Indianapolis, Ind.

ARMORPLY

● A metal faced plywood panel of high quality for building better panel bodies.

Armorply is the lightest panel of its type available. It is faced with rust resisting galvanneal steel, and has a hard birch back.

Write for samples, prices and full information.

U.S. PLYWOOD
UNITED STATES PLYWOOD CO. INCORPORATED
103 Park Avenue New York, N. Y.

Series 900
WALKER
Hydraulic Jacks

Give you extra value features for car, truck or bus equipment and heavy duty bench work or shop jobs. One of ten sizes—capacities 1½ to 20 tons—at left. Order from your jobber—and see the complete line of Walker Jacks for every service need.

WALKER MFG. CO.
Racine, Wisconsin

Shop Equipment

(CONTINUED FROM PAGE 167)

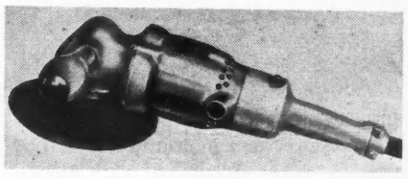
Lubricating Gun

THE Lincoln Twin-Cylinder Airline Lubrigun is a portable unit for chassis lubrication. It embodies the two-stage

principle in compact design. The primer pump reaches the bottom of the original container and feeds the lubricant under high pressure to the hose outlet where it is delivered at the rate of 1/12 oz. per stroke.

Black and Decker Sander

THE Black and Decker No. 17 Junior Sander priced at $39.50 is a light weight unit for intermittent service. At



no load it turns 3200 r.p.m. and it weighs 7¾ lb. Standard equipment is

Ahlberg Ground Bearings

40%
Saving Over New Bearing Costs

AHLBERG BEARING CO.
Chicago

Branches and Distributors Everywhere

Ahlberg Ground Bearings

BE SAFE!
Your trucks need the greater safety of genuine
BERG
POWER BRAKES WITH REACTIONARY CONTROL
for FORD CHEVROLET and INTERNATIONAL TRUCKS
Up to 3-Ton Pay Load, $18
Above 3-Ton Pay Load, $25
Why pay more? The BERG Brake has everything and is fully guaranteed. Satisfaction assured. Write at once for discounts.
Power Brakes for Pass. Cars, $12.50
BERG BROS. MFG. CO.
4520 W. North Ave., CHICAGO

FOR 1937—
THE DEARBORN LINE
CAB-OVER-ENGINE FOR FORD TRUCKS
Radically lower in height—
Completely streamlined front end—
Remarkable accessibility for servicing.
TRANSPORTATION ENGINEERS, INC.
10441 Shoemaker Ave., Detroit, Mich.

STANDARD OR SPECIAL PURPOSE
DUMP BODIES
OVERSIZE HYDRAULIC HOISTS
WRITE FOR BULLETIN AND PRICES
THE PERFECTION STEEL BODY CO.
GALION, OHIO

EXTRA PROFIT WITH MAGNUSOL!

Because it cleans faster, MAGNUSOL, the new motor-block and chassis cleaner, is being used by fleet owners and maintenance men everywhere to make extra maintenance profits.

MAGNUSOL cleans more thoroughly—more quickly by making oils and greases readily soluble in water. Its use cuts costs—labor and time. Spray it on! Hose it off!

Write for new MAGNUSOL folder which gives the whole story.

Magnus Chemical Co., Inc.
38 South Ave.
Garwood, N. J.

7 in. molded rubber pad, three 7 in. sanding disks and detatchable side handle.

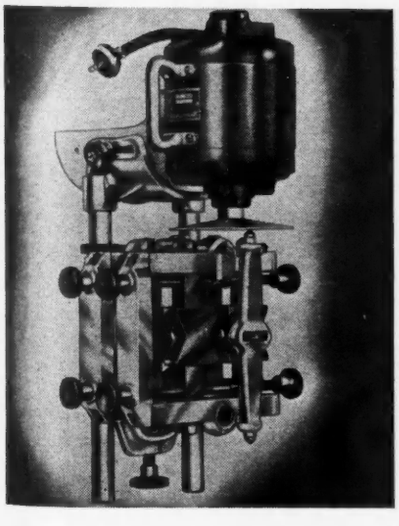
Engine Analyzer

THE Moto-Lab made by Eichlin and Eichlin Inc., San Francisco, Cal., is made and sold at the lowest price pos-

sible when all of the requirements of the small shop are taken into consideration. All of the instruments are removable so that several mechanics can use the instruments at the same time. The cabinet is of all steel construction with welded joints and is finished black crackle enamel.

Brake Shoe Grinder

A NEW Thomason Model 60 brake shoe grinder embodying definite improvements has been announced by Shepard-Thomason Co., Los Angeles, Cal.



This new model is equipped with interchangeable discs which permit getting under the backing plates; which has not been possible heretofore, and therefore, give this grinder a much wider range of utility, making it desirable for brake grinding on Fords, Chevrolets, Plymouths and other vehicles.

It works direct from the axle or steering spindle and is provided with self-aligning V blocks which conform precisely to the axle regardless of taper. Two V's of different size on each block accommodate both straight and tapered axles from the smallest size up to 4½ in. diameter. The machine is equipped with an inside micrometer for measuring the drum and a means of interlocking this micrometer with the grinder. A positive stop automatically prevents grinding shoes to a smaller diameter than that for which the grinder is set. This model accommodates shoes from 10 in. up to 24½ in. in diameter. Motors are optional with purchaser; the size recommended depending on the class of work.

(Turn to Page 170, Please)

The Finest TRUCK LIGHT ever developed

Unity DeLuxe ROAD LAMP

$5.00 LIST PRICE

Complete With • Universal Mounting Bracket • 14-gauge Waterproof Cable • Clamp-On Switch • Cable Support Clips • Terminals With Insulators • Installation Instructions.

Speeds Up Schedules in Fog, Mist and All Night Driving

● A truck equipped with the Unity Road Lamp never has to slow down when passing an oncoming car with glaring lights. This Road Lamp, mounted on the bumper arm, projects a powerful beam that penetrates the glare and shows the right side of the road clearly. It gets down *under* fog and illuminates the road far more effectively than headlights or other auxiliary lamps.

Your trucks will make better time on night runs and your accident ratio will be reduced when you equip with the Unity Road Lamp. If your dealer doesn't have this new light, order direct.

SUPERIOR IN ALL DETAILS TO LAMPS SELLING AT TWICE THE PRICE....

● Scientifically spun 6½-inch reflector —the same as used in Unity's famous Safetylight, world's most powerful driving light.
● 32-candlepower pre-focused bulb.
● Special baffle shield for greatest effectiveness in fog, mist, rain and snow.
● Approved light-filter lens to give increased lighting qualities without glare.
● Chromium-plated heavy-gauge shell withstands hardest service.
● One-bolt malleable, cadmium-plated bracket (Universal for right or left) makes instant, sturdy, fool-proof attachment.

UNITY MANUFACTURING COMPANY · CHICAGO
Makers Also of Safetylight, World's Most Powerful Driving Light

Shop Equipment

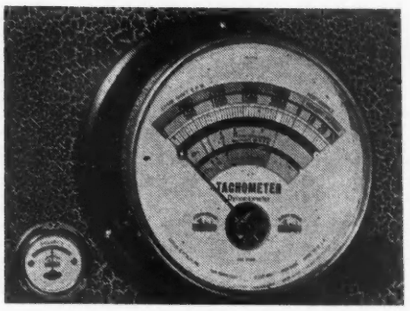
(CONTINUED FROM PAGE 169)

King MT-250

THE Electric Heat Control Co., Cleveland, announces a new unit, the King MT-250, which is a combination of the King MT-210 ignition tester, with the exhaust gas analyzer added. It is claimed that the exhaust gas analyzer will indicate whether maximum power is being obtained from the fuel, and if not, where the trouble lies.

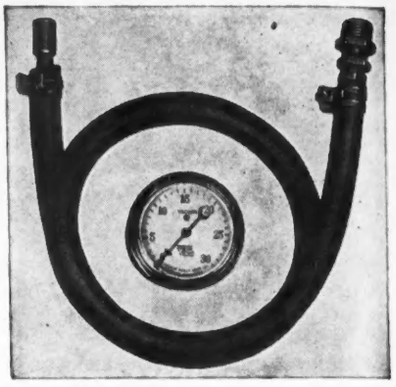
Tachometer

EICHLIN AND EICHLIN INC., San Francisco, Cal., have an electrical tachometer which can be set to two, three or four times engine speed when great sensitivity is required. To attach all that is necessary is to clip two lead wires to the primary terminals of the ignition coil. The instrument is wired within the test panel to the lamp socket current.



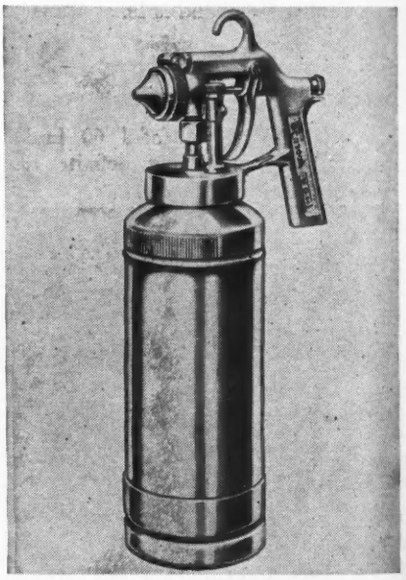
Vacuum Tester

THIS vacuum testing outfit is a time-saver in locating leaks in the vacuum system on trucks and trailers as well as in determining the amount of vacuum developed by the motor. The outfit includes an accurate vacuum gage, a length of hose, and an assortment of fittings sufficient to make almost any connection. Vacuum Power Equipment Co., Detroit, Mich.



Binks Spray Equipment

PRESSURE Cup and Pressure Tank outfits for Sound Deadener Spraying are now offered by Binks Mfg. Co., 3114 Carroll Ave., Chicago.



Ideal for all types of spraying with heavy material such as cut back and emulsified asphalt where production requirements are slight. Most sound deadening preparations can easily be sprayed with this gun.

TRADE YALE MARK
DIRECTION SIGNAL
for TRUCKS
BUSES and AUTOMOBILES
Safety for your vehicle and others
Many states now require electrical signals on trucks and buses. Others are considering it.
Protect *your* vehicle and save damage suits.
Use Your Hands for Driving

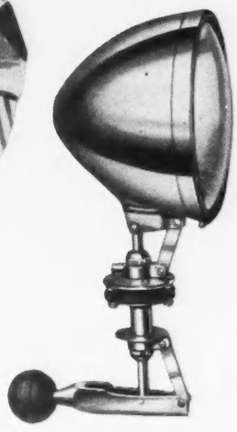
1. Neon lighted arrows that flash intermittently.
2. Arrows cannot be confused with *tail* or *stop light.*
3. Neon light visible at greater distance, day or night.
4. Turned on manually at steering wheel, and turned off automatically.
5. No hand direction signals necessary.—No need to lower window and put hand out in rain.
6. All high tension wires completely enclosed in DIRECTOR signal, leaving only 6-volt wire from battery.

Use the YALE DIRECTOR to indicate turns

See our Exhibit at the National Automobile Show, New York City, Booth C-26

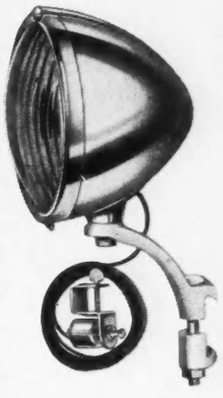
THE YALE & TOWNE MFG. CO.
DETROIT DIVISION
12340 CLOVERDALE DETROIT, MICH.

● Lorraine makes night driving safe—not only for you but for everybody on the road. Its inquisitive, powerful beam searches the road for two thousand feet ahead and shows the hidden dangers before you come to them. Culverts, ditches, sharp curves and bad spots in the road are thrown into instant view against the background of lurking darkness with Lorraine, the World's Finest Driving Light.



The Model 60 Utility Light has been developed to meet special requirements of utility and service trucks for overhead mounting. This model can be conveniently operated from the driver's seat, throwing a powerful beam in any desired direction or angle. The specially-designed bracket protects the roof and prevents leaks, and complete instructions are supplied covering the simple installation. All parts are heavily chrome-plated and the construction insures easy, free mechanical operation during all kinds of weather.

No. L-4161 Model 60 Utility Light—List Price $20.00.



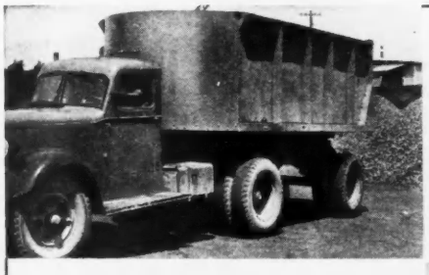
Four Fog Lghts are available in the Appleton line, two of these Lorraine models and two Appleton models. Both lights are sturdily constructed, using heavy gauge materials and malleable iron brackets. Lenses are thick to avoid breakage.

Lorraine L-6398 Model 41 Chrome Fog Light—List $6.00
Lorraine L-6397 Model 42 Black Fog Light—List $5.00
Appleton L-3398 Model 45 Chrome Fog Light—List $5.00
Appleton L-3397 Model 47 Black Fog Light—List $4.00

Because of its features and high quality, the new Lorraine Model 36 Pre-focus Driving Light has been selected by Greyhound for equipment on the new Streamlined busses. The patented rotary electrical contact makes it possible to turn the lamphead freely in all directions continuously. The pre-focus bulb develops a perfect beam pattern for the life of the light, with no adjusting necessary assuring maximum efficiency at all times.

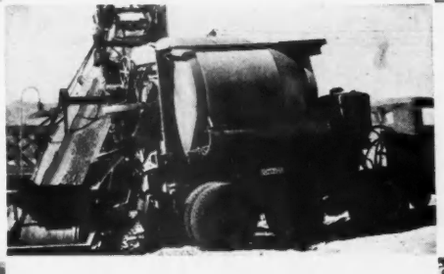
See and inspect our display at the National Truck Show in Newark, Booths Nos. 291 & 292, November 3rd to 7th, displayed by Hegeman-MacCormack Corporation, eastern representatives.

APPLETON ELECTRIC COMPANY
(AUTOMOTIVE DIVISION)
1753 WELLINGTON AVENUE CHICAGO, ILLINOIS



A HIGH QUALITY JOB FOR EVERY NEED at Low Cost

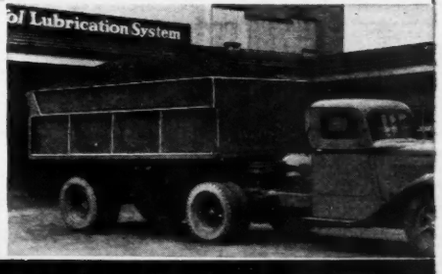
There's an Edwards semi-trailer for every kind of trucking job. Designed right. Chassis and bodies matched as units. Built like battleships to stand the gaff and put profit in your pocket.



Edwards quality is high; but prices are not. Edwards fleets have grown from single units given the acid test on the job. Truckers find it pays to investigate Edwards. Why don't you?

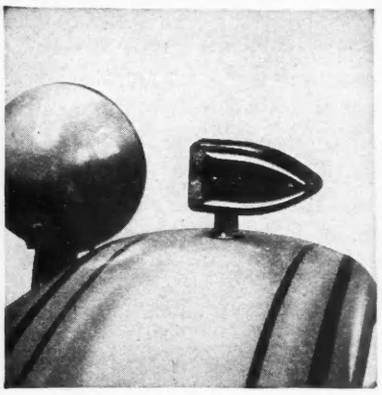
Attractive proposition for dealers.

Write for details.



EDWARDS QUALITY SEMI-TRAILERS

EDWARDS IRON WORKS, INC., SOUTH BEND, INDIANA



Mounted on fender to warn passing vehicles of turn

Longest Life Most for the Dollar

Check
TURNSIGNAL
Values

- CUT-OFF REMINDER
- RUST-RESISTING METAL *(Baked Enamel Finish)*
- WELDED REINFORCEMENTS *(No Rivets to Work Loose)*
- DEPENDABLE SWITCH

TURNSIGNALS
Will Stand Up and Take It!

Let us tell you more about them
Watch for this trademark

TURNSIGNAL
CORPORATION
400 E. Rittenhouse St.
(Germantown) Phila., Pa.

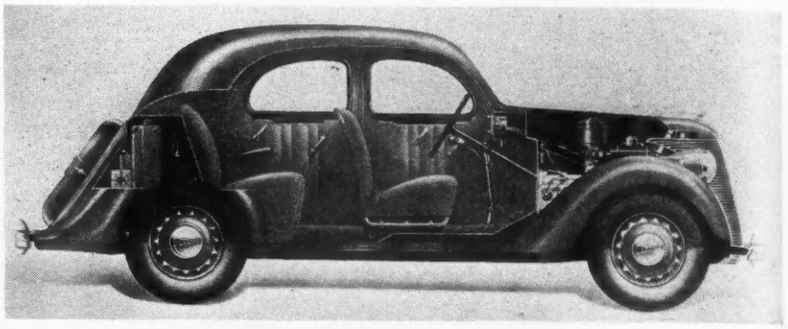
FENDERS
ROLLED OR DRAWN
HOODS AND STAMPINGS
FOR CABS
Replacement or Factory Equipment

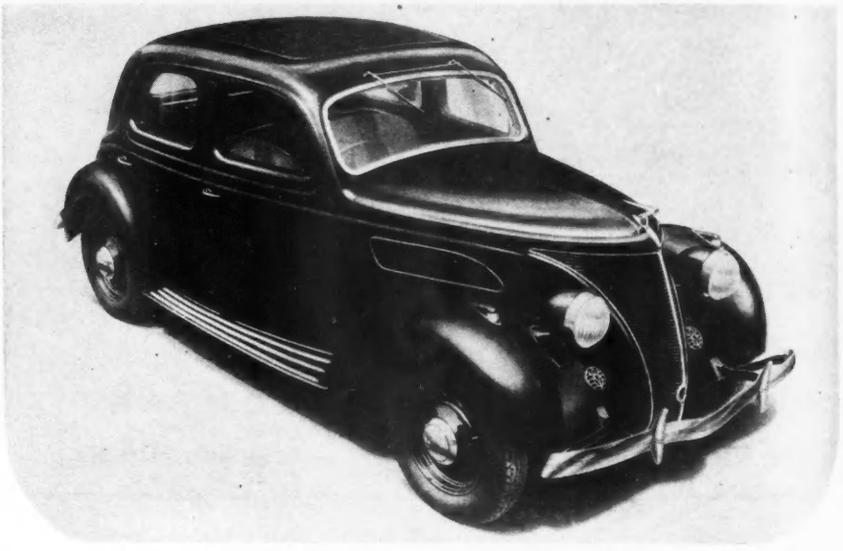
Standard Rolls for Various Sizes of Fenders

Standard Louver Dies

MOTORS METAL MFG. CO.
5936 Milford Ave. Detroit, Mich.

The 1937 Ford?





At the moment of writing Ford has not made public the announcement of its 1937 line. However, from unofficial sources we hear that in appearance the American Ford will be so much like the British Ford that we here give you some views of the latter with the firm conviction that after a good look at these views the sight of the American job will not give you any surprise. The photographs speak for themselves. We are pretty sure that the 135 cu. in. V8 22 hp. (2.6 in. bore by 3.2 in. stroke) engine in the British job will find its way into the American car. We will give you complete details of the American Ford in the December issue.

Schrader Chuck Gauge

THE new design of the No. 1070 Schrader chuck gauge provides "finger-tip control" for faster, accurate air service. The trigger alone regulates inflation, testing and deflation. The chuck gauge also permits the operator to detect any unusual loss of air first, and correct the cause before roadside delay occurs. A. Schrader's Son, 470 Vanderbilt Ave., Brooklyn, N. Y.

Ruggedwear Resurfacer

RUGGEDWEAR resurfacer is a compound for use in repairing flooring, walls, cracks and for leveling off and may be used over concrete, wood, linoleum, etc. It is easily mixed and applied with a trowel and it sets in a few hours. It may be applied to broken concrete and finished to a featheredge. Flexrock Co., 800 N. Delaware Ave., Philadelphia.

Permatex Lubricant

THE Permatex Company, Sheepshead Bay, N. Y., has developed a new lubricant for new and reconditioned motors that will be marketed under the name of Permatex tune-up oil.

The manufacturer claims superior carbon removing and penetrating properties.

DeVilbiss

Spray-Painting Equipment—Spray Booths—Canopy Exhaust Systems —Exhaust Fans—Air Compressors —Hose and Hose Connections— Oil Guns.

Write for catalog

THE DEVILBISS COMPANY
TOLEDO, OHIO

Distributors or direct sales and service representatives available everywhere.